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ABSTRACT

This is the final report of a program in which 51 women scientists visited 12 junior high and high schools in North Carolina and a total of 128 schools in four large American metropolitan areas. The purpose of these visits was to provide students with a chance to meet women scientists as role models. The report is divided into 9 chapters and 8 appendices. The topics presented include an introduction to the program, participating schools, background information on the women scientists, the development and/or process of locating instructional materials, field representatives and school personnel, program operations, data collection, and program evaluation. Included in the appendices are letters, records, guidelines, resource materials, and questionnaires generated by the program. (SA)

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August 1979

The Visiting Women Scientists Program

1978-79

Final Report

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

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RTI's Project Director for the 1978-79 Visiting Women Scientists Program was Ms. Carol Place. Ms. Mary Ellen Taylor served as the North Carolina field representative and assisted in materials development and supervision of field operations; Mr. Larry Conaway assisted with overall project supervision and preparation of reports and the Manual on Program Operations. Dr. Iris Weiss, the project director for the 1978 pilot program was on leave of absence during much of the 1978-79 program. Prior to her leave of absence she provided overall project supervision and coordinated development of project materials; while on leave she assisted with reports and the Manual on Program Operations. Ms. Millie Sparks and Mr. David Moazed conducted data processing activities. Ms. Celestine Smith was the project secretary; Ms. Edna Harris, Ms. Barbara Elliott, and Ms. Linda Shaver provided secretarial support for this report.

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I. INTRODUCTION

The National Science Foundation (NSF) recognizes that the underrepresentation of women in science careers is a serious waste of national talent, and one of the responsibilities of the NSF's Science Education Directorate is to develop and test methods of increasing the participation of women in careers in science. In fiscal year 1976 NSF inaugurated a Women in Science Program which consists of three components: (1) Science Career Workshops for women undergraduate and graduate students in science, (2) Science Career Facilitation Projects for women who wish to reenter careers in science, and (3) a Visiting Women Scientists Project for high school students.

In June 1977 the Center for Educational Research and Evaluation of the Research Triangle Institute (RTI) in North Carolina was awarded a contract to design a pilot Visiting Women Scientists Program to motivate female high school students to consider and pursue careers in science (including engineering, mathematics, and social science, as well as the life and physical sciences). This pilot program was conducted by RTI during the spring of 1978. Based on its success, NSF contracted with RTI to conduct a similar program during the 1978-79 school year.

A. Overview of the 1978 Pilot Visiting Women Scientists Program

The design phase of the pilot program included the development of (1) a roster of women scientists, (2) a logistical plan for scheduling and conducting visits, (3) materials to be used in the program, and (4) plans for evaluation. Feedback from a five-member Advisory Panel was used in revising the plans for the pilot program, and the forms and procedures to be used were approved by the Office of Management and Budget. A complete description of the planning activities can be found in the final report for the design phase.[1]

The objectives established for the Visiting Women Scientists Program were:

1. To provide an opportunity for high school students to meet and interact with women scientists as role models.
2. To provide examples of women in a variety of science careers.
3. To provide evidence of women who have combined personal lives and successful careers in a variety of ways.

4. To provide information about the importance of science and scientists in solving world problems.

5. To provide information about science and technology job opportunities for women in the future (including emerging careers), and equal opportunity laws and affirmative action programs which guarantee women access to these opportunities.

6. To provide information about the preparation needed for various science careers, the importance of keeping various options open, and the sources of financial aid which are available for obtaining this preparation.

7. To encourage teachers and counselors to provide support and encouragement to women who are considering science careers.

8. To promote the attitude among both males and females that science careers are appropriate for women as well as men.

9. To encourage high school females to seek additional information about women in science careers, and to provide help in obtaining such information.

The 1978 pilot program, which included an experimental evaluation, involved visits by 40 women scientists to 110 high schools across the United States. An RTI field representative accompanied each woman scientist and was responsible for working with each school to establish a schedule, for preparing each woman scientist for her visits, and for assisting during the day of the visit.

A national sample of high schools was offered the opportunity to participate in the pilot program. Those that accepted the offer were randomly assigned to experimental and control groups. Additional schools were contacted for visits when the original sample did not provide a sufficient number of interested schools. Students in all schools were given the opportunity to return a postage-paid postcard to RTI for additional information, and all schools were sent a resource packet of science career information. In addition to the visit, experimental and additional schools received "The Women's Prejudice Film" to be shown before the visit (available through Sandler Institutional Films, Inc., Hollywood, California).

Typically, a circuit of three or four schools in a geographic area were visited in one week by an RTI field representative and a woman scientist from the area. Half of the geographic circuits were randomly assigned to be visited by women scientists chosen from the roster developed for this program; the remaining circuits were to be visited by women scientists who were "handpicked" based on recommendations.

Each visit in the pilot program consisted of some combination of the following activities: (1) a large group meeting usually consisting of approximately 90 tenth grade females; (2) one or more seminars of approximately 25 females who were particularly interested in exploring science career opportunities; (3) meetings with individual classes, usually including approximately 30 females and males; (4) a meeting with school staff members including counselors, librarians, and representatives of the science, mathematics and social science departments; (5) a time when the woman scientist and field representative would be available to speak with interested students on an informal basis; and (6) an informal meeting with the principal and contact person.

Evaluation of the 1978 pilot program was based on data provided by students, school contact persons, women scientists, and field representatives. In addition, RTI staff members observed a number of the visits. Although there were a few problems in the pilot program, student reactions to the visits were extremely favorable, and both women scientists and school contact persons responded overwhelmingly in favor of future participation in the program.

The procedures and results of the 1978 pilot program are described in detail in the final report for the pilot program.[2]

B. Overview of the 1978-79 Visiting Women Scientists Program

The pilot program demonstrated that a Visiting Women Scientists Program for secondary schools is feasible. The program functioned smoothly and based on the data collected, there was a great deal of interest in continuing it. In addition, comparisons between experimental and control schools demonstrated that the program was effective in encouraging high school females to seek further information about science careers.

For 1978-79 the program remained essentially the same, with a few modifications suggested by pilot program experiences. Recommended changes were discussed at a program review meeting which included a field representative and two women scientists who had participated in the pilot program, as well as representatives of the original Advisory Panel.

The 1978-79 program involved visits by 51 women scientists to 12 junior high and high schools in North Carolina and a total of 128 schools in the areas of Los Angeles, Philadelphia, and Minneapolis-St. Paul. Each school was visited by both a woman scientist and an RTI field representative. The North

Carolina visits were conducted to test revised procedures and materials, and also to provide the program to the schools. The three metropolitan areas were selected to reduce costs and to assure diversity.

For the 1978-79 program an RTI field representative and a woman scientist from the area generally visited three schools in one week, on Tuesday, Wednesday, and Thursday. Each visit consisted of some combination of the following activities: (1) one or two large group meetings of approximately 100 ninth and/or tenth grade female students; (2) one or more follow-up meetings to the large group for approximately 30 females most interested in pursuing a science career; (3) one or more seminars for approximately 25 females, generally from grades 11 and 12, who were particularly interested in or suited for a science career; and (4) a meeting with various members of the school staff, including counselors, librarians, teachers, and administrators.

Since the effectiveness of the Visiting Women Scientists Program was determined during the pilot program, there was no need for an experimental-control comparison in the 1978-79 program. However, in order to ensure successful program implementation and to provide descriptive data for reporting purposes, evaluative data were again collected from students, school contact persons, women scientists and field representatives. As in the pilot program, student reactions to the visits were very favorable; and both women scientists and school contact persons responded overwhelmingly in favor of future participation in the program.

In addition to conducting visits to schools, the 1978-79 program included two other activities. A national Women Scientists Roster was developed for the use of school districts and organizations interested in conducting programs similar to the Visiting Women Scientists Program. It will be available through the National Science Teachers Association.

The Manual on Program Operations was also developed for the use of those who may be interested in designing and conducting programs to bring women scientists in contact with female students. The manual describes in detail the materials and procedures used in conducting the Visiting Women Scientists Program, and it recommends steps which can be taken to avoid problems. The manual will be submitted to the National Technical Information Service (NTIS), and to the Educational Resources Information Center (ERIC).

C. The Organization of this Report

The schools which participated in the 1978-79 Visiting Women Scientists Program are described in Chapter II, while Chapter III describes the women scientists. Chapter IV presents information about the materials used in the 1978-79 program. Chapter V describes the roles of the field representatives and school contact persons, and Chapter VI describes program operations and meetings conducted in the schools. The Women Scientists Roster and the Manual on Program Operations are discussed in Chapter VII. The forms and procedures used in collecting evaluative and descriptive data are explained in Chapter VIII, and the evaluation results are presented in Chapter IX.

II. PARTICIPATING SCHOOLS

A. School Selection in the 1978 Pilot Visiting Women Scientists Program

Schools in a national probability sample were offered the opportunity to participate in the 1978 pilot Visiting Women Scientists Program; those who expressed interest in participation were randomly assigned to experimental and control groups. These procedures made it possible to estimate the percent of schools in the nation which would be interested in participating in the Visiting Women Scientists Program if given the same opportunity using similar contact procedures. At the same time it was possible to evaluate the effectiveness of the program and to generalize these results to the nation as a whole.

While the use of a national probability sample has a number of important advantages in terms of evaluation design considerations, it has distinct logistical disadvantages. In the pilot program, the schools to be visited were dispersed widely throughout the United States. To reduce travel costs, they were clustered with four schools in the same geographical area, to be visited during a single week. While this approach reduced costs somewhat, there were still high travel costs for field representatives, and women scientists. This approach also created scheduling problems. It was often difficult to find a week and a schedule of visits within that week which satisfied all four schools. In addition, when a visit had to be cancelled by a school it was often impossible to reschedule the visit during that week.

B. The Three Metropolitan Areas Included in the 1978-79 Visiting Women Scientists Program

For the 1978-79 Visiting Women Scientists Program, a cost-effective operation was devised. Rather than selecting a random sample of schools, the program was localized in three metropolitan areas of the country, and costs were reduced by using field representatives and women scientists from the three areas. Several additional North Carolina schools were visited early in the program in order to test revised materials and procedures.

Limiting the program to three areas helped to improve communication with school and district personnel. In the pilot program it had been necessary to restrict communication with school and district personnel to mail and tele-

phone contact. In the 1978-79 program, it was possible to work more closely with district personnel in planning contact with schools; in Philadelphia and Los Angeles it was possible to meet with a number of school representatives prior to the visits.

While the 1978-79 program was not based on a random sample, it was still considered important to include a reasonably diverse group of schools. In order to increase the number of urban schools visited, the decision was made to conduct the 1978-79 program in three metropolitan areas containing a large number of urban schools.

The three metropolitan areas chosen were Los Angeles, Philadelphia, and Minneapolis-St. Paul. School officials in the county of Los Angeles and the school district of Philadelphia had contacted RTI during the pilot program to indicate interest in participation, but the design of the pilot program made it impossible to include them at that time. When recontacted during the planning stage of the 1978-79 program, both school systems expressed interest in participating. Minneapolis-St. Paul was selected as a midwestern area which would provide diversity. Four of the larger districts in that area were contacted initially about participation, and all four indicated they would like to participate. The archdioceses in the three areas were also contacted and each of them indicated interest in including some of their schools.

Once the three areas had been chosen for the 1978-79 Visiting Women Scientists Program and district interest determined, a number of steps were taken to obtain and contact schools, as described in the following sections.

C. Obtaining Schools in the Three Areas

Due to the ever-increasing number of research studies involving public schools, state education officials have begun to control access to the schools in their state. The Council of Chief State School Officers has established the Committee on Evaluation and Information Systems (CEIS) which has as one of its major functions the screening of research studies which involve public schools. While the Visiting Women Scientists Program is not primarily a research study, it does involve a considerable amount of data collection in the schools. To avoid possible problems in obtaining state clearance of the Visiting Women Scientists Program, CEIS was asked to review and approve the plans for the program.

Following CEIS approval of the plans for the program, a letter and descriptive materials were sent to the Chief State School Officer (CSSO) in each of the states which would be involved. The CSSOs were asked to contact RTI if they had any questions about the program. Similarly, the superintendent of each participating district and archdiocese received a letter describing the program and a form to indicate approval to contact schools in their system (see Appendix A for the letters and superintendent form). None of the CSSOs or district superintendents raised any objections to including their schools; in fact, several wrote letters of endorsement for the program, which RTI included with materials sent to the schools.

D. Contacting Schools

The procedures used in selecting and contacting schools varied. In Minneapolis-St. Paul it was possible to invite all junior high and high schools in four large districts to participate, while also including private and parochial schools. In Philadelphia and Los Angeles, it was necessary to select a subset of the schools. In Philadelphia, the program was initially offered to senior high schools and to some parochial and private schools. In Los Angeles, county office personnel originally selected one high school and an alternate per district; a few parochial and private schools were also included. Alternate schools were scheduled when originally selected schools did not wish to participate.

In Philadelphia and Minneapolis-St. Paul, original contacts did not provide the desired number of schools to be visited. Therefore, letters and forms were sent to additional districts in those areas. Also, schools who did not return their form to indicate interest were contacted by telephone. These efforts provided ten additional schools in Pennsylvania and six in Minnesota.

A letter was sent to the principal of each school along with a brochure describing the Visiting Women Scientists Program. A form was included on which they were to indicate interest and provide information about possible dates for the visit and a contact person to help plan the visit. A postage-paid envelope was enclosed for the return of the form. See Appendix B for the principal letter and form.

Since many of the schools in Los Angeles and Philadelphia are part of a single school system, it was possible to arrange a meeting in each area with

representatives of the schools to be visited. RTI staff explained the purposes and procedures of the program and gave the participants, many of whom would later serve as contact persons, an opportunity to ask questions.

E. Difficulties in Scheduling Visits

Care was taken in scheduling visits to avoid dates on which principals indicated their school would not be in session or would have conflicting activities taking place. However, a number of problems arose with originally scheduled visit dates.

Twenty-seven schools which were scheduled to receive visits experienced some difficulty with the originally scheduled date. The most common scheduling problems were: (1) schools closed due to snow, (2) the visit date was immediately before or after vacation and the school felt the visit would be inconvenient; and (3) the visit date conflicted with other activities such as testing, teacher workdays, or other major school functions. In all but one case the schools wished to reschedule the visit, and these requests were accommodated. In the one case, the school preferred not to participate.

This year's design to visit three schools in one week allowed visits to be easily rescheduled when necessary, and it was nearly always possible to allow a school to select the specific date for rescheduling. When it became necessary, field representatives were scheduled to conduct visits on as many as four days in a week. While the original plan was to schedule visits on Tuesday, Wednesday, and Thursday, some schools preferred a visit on Monday or Friday; in other cases scheduling conflicts made it necessary to schedule a visit on one of those days.

F. Description of the Schools

One hundred and forty schools participated in the 1978-79 Visiting Women Scientists Program; including 46 in Los Angeles County, 42 in the Minneapolis-St. Paul area, 40 in the Philadelphia area, and 12 in North Carolina. Included in the 140 schools were 119 public schools, 15 parochial schools, and 6 independent private schools. One hundred and nine of the visits were conducted in high schools; 20 in junior high schools; 6 in junior-senior high schools; 4 in schools with the grades K-12; and 1 in a school with grades 6 through 8.

As shown in Table 1, the schools were distributed among a number of different types of communities. One percent were located in rural areas, six

Table 1

DISTRIBUTION OF THE SCHOOLS AMONG COMMUNITY TYPES[1]

	Number of Schools	Percent of Schools
Rural or farming community	2	1
Small city or town (less than 50,000)	8	6
Urban		
Medium-sized city (50,000-100,000)	16	12
Large city (100,000-500,000)	27	20
Very large city (more than 500,000)	40	30
Suburban		
Suburb of medium-sized city	4	3
Suburb of large city	20	15
Suburb of very large city	18	13
TOTAL	135	

[1] Does not include five schools for which this information was not provided.

percent in small cities or towns, 62 percent in urban areas, and 31 percent of the schools were located in suburban areas.

Junior high school enrollments averaged approximately 1,049 students; junior-senior high schools averaged approximately 1,208; and the average high school enrollment was approximately 1,867. The smallest school visited had a total enrollment of 134 students; the largest school contained 4,350 students. The distribution of schools according to enrollment is shown in Table 2.

Table 2

SCHOOL ENROLLMENTS[1]

School Enrollment	Number of Schools	Percent of Schools
300 or less	5	4
301 - 500	9	7
501 - 1,000	20	15
1,001 - 1,500	26	20
1,501 - 2,000	30	23
2,001 - 2,500	21	16
More than 2,500	22	17
TOTAL	133	

[1] Does not include seven schools for which this information was not provided.

As shown in Table 3, many schools visited in 1978-79 had substantial minority enrollments. Over one-fourth had greater than a 60 percent total minority enrollment, and over 15 percent had minority enrollments greater than 90 percent. A total of 37 schools had enrollments that were 30 percent or more black students; 12 of these schools were more than 90 percent black. Thirteen schools had Hispanic populations constituting more than 30 percent of their total enrollment; five of these schools were more than 80 percent Hispanic.

High schools were asked what percent of their graduating seniors go on to four-year colleges, two-year colleges or technical schools. Of the 111 high schools that responded to this question, one-fourth had over 50 percent of their graduating seniors going on to a four-year college; and in almost half of the high schools, more than 60 percent of their seniors were headed for either a two-year college, technical school, or four-year college.

Table 3

NON-CAUCASIAN ENROLLMENTS OF THE SCHOOLS[1]

Percent of Non-White Enrollment	Number of Schools	Percent of Schools
0	9	7
1-10	36	26
11-20	22	16
21-30	16	12
31-60	18	13
61-90	14	10
91-100	21	15
TOTAL	136	

[1] Does not include four schools for which this information was not provided.

III. WOMEN SCIENTISTS

A. Selection of Visitors

Fifty-one women scientists, employed in various science careers, conducted visits for the 1978-79 Visiting Women Scientists Program. Six women from North Carolina were chosen to visit the twelve North Carolina schools and 45 women were chosen to visit 128 schools in the three other areas of the country.

The visitors for 1978-79 were usually selected from those who expressed interest in participating in the pilot program, or those who asked to be included in the Women Scientists Roster. In all three areas industries and various minority organizations also were contacted for recommendations. However, these original sources did not provide a sufficient number of minority and industry women in Los Angeles and Philadelphia; thus additional sources were contacted to find women near those cities.

B. Characteristics of the Visiting Women Scientists

In selecting the fifty-one women scientists who participated in the 1978-79 Visiting Women Scientists Program, an attempt was made to select more women from industry than from academia and to include as many women as possible in non-traditional fields. This was done to reflect projected employment opportunities. The composition of the group of 51 visitors by area of science, type of employment, race or ethnic background, and year of earliest degree can be seen in Tables 4-7. Note that only one mathematician conducted visits for this program; this was due to the lack of applications from women in mathematics in the areas of the country chosen for visits.

Twenty-seven percent of the woman scientist visitors had obtained their doctorate; 35 percent had a master's degree as their highest degree, and 37 percent had no degree beyond a bachelor's degree.

The woman scientist application form asked for the dates in which degrees had been obtained. Table 7 shows the distribution of the visitors according to the year in which they received their earliest degree. Based on the assumption that the year of award of a bachelor's degree is a reasonable measure of age, the visitors represent a good balance across a span of ages.

Table 4

VISITING WOMEN SCIENTISTS--
AREA OF SCIENCE

	Number of Visitors	Percent
Biological Science	11	22
Physical Science	12	24
Engineering	22	43
Mathematics	1	2
Social Science	5	10
Total	51	

Table 5

VISITING WOMEN SCIENTISTS--
TYPE OF EMPLOYMENT

	Number of Visitors	Percent
Academic	14	27
Non-Profit Organization	5	10
Profit-Making Organization	29	57
Government	3	6
Total	51	

Table 6

VISITING WOMEN SCIENTISTS--
RACE OR ETHNIC BACKGROUND

	Number of Visitors	Percent
Asian or Pacific Islander	1	2
Black	12	24
Hispanic	3	6
White	35	69
Total	51	

Table 7

VISITING WOMEN SCIENTISTS--
YEAR OF EARLIEST DEGREE

Year of Earliest Degree	Number of Visitors	Percent
1936-55	5	10
1956-60	5	10
1961-65	4	8
1966-70	17	33
1971-73	11	22
1974-76	5	10
After 1976	4	8
Total	51	

The logistical plan for the 1978-79 program was to have women scientists from the same geographical area as the schools visit three schools in one week. Several women conducted visits to more or fewer than three schools, but no woman scientist conducted more than three visits in one week. Three women scientists visited one school; 16 visited 2; 22 visited 3; 7 visited 4; 2 visited 5; and 1 woman scientist visited 6 schools. Five visits were conducted with a team of two women scientists.

C. Teams of Two Women Scientists

For the 1978-79 program, five schools were visited by a team of two women scientists; three of those team visits were observed by RTI staff. The women scientists and the school staffs expressed positive feelings about having two women scientists and the field representative visit with students. The contrast between women in two different fields was enlightening and informative. It also offered the students an opportunity to obtain a more varied picture of women in science by giving them a perspective on two careers and lifestyles and allowing them to observe the interaction of three women.

A recurring difficulty with two women scientists was the lack of time. In schools' 45-60 minute periods, there was little time for anyone to make a complete presentation. This was more of a problem when one woman dominated, leaving even less time for the other woman's area of science. This situation

was improved when follow-up meetings were scheduled, since the extra time allowed students an opportunity to explore additional ideas with each woman. In cases where class periods could be combined and more time allotted per meeting or where an additional day could be used, the effectiveness of the two individuals would probably be increased.

D. Problems Encountered in Scheduling Women Scientists for Visits

Overall, there were only minor difficulties in scheduling women scientists to conduct visits. Because the visits were conducted within a 50 mile radius of each area and nearly all the women scientists were from the same geographical area as the schools, it was relatively easy to substitute another woman scientist for a particular visit on short notice. Two women scientists withdrew for health reasons and another woman's employer would not allow her to visit schools outside her community. In each case, other women scientists were located to conduct those visits.

Suggestions had been made to utilize minority women scientists as role models in minority schools whenever possible, as well as in other schools in their geographical area. One difficulty encountered in scheduling women scientists was finding minority women scientists within the area to visit some schools with large minority enrollments. Thus it was necessary to locate minority women from nearby cities to conduct several visits. Minority women visited 43 of the schools which participated in the 1978-79 Visiting Women Scientists Program. Sixteen of those schools were predominantly white; the remaining 27 had greater than a 60 percent minority enrollment.

IV. MATERIALS FOR THE VISITING WOMEN SCIENTISTS PROGRAM

A. Locating Materials for the 1978 Pilot Program

During the planning phase of the pilot program an extensive search was made for materials which might be useful in the Visiting Women Scientists Program. Bibliographies of career education materials and publishers' catalogues were examined, and review copies of relevant materials were obtained. In addition, professional organizations such as the American Chemical Society and the Society of Women Engineers, and a variety of industrial firms such as General Electric and IBM were also contacted to obtain existing materials relating to science careers for women. Finally, Advisory Panel members and NSF personnel provided copies of some materials and information about other materials. Many of the early contacts produced leads for additional contacts, and these were subsequently carried out. As a result, RTI obtained a rather comprehensive set of relevant available pamphlets, books, films, filmstrips, and bibliographies of additional materials.

The materials which were collected were examined to determine their appropriateness for meeting the objectives that had been established for the Visiting Women Scientists Program. Several of the materials proved to be suitable for use in the pilot program, either for use by the field representatives, for distribution to students, or for inclusion in resource packets to be given to the schools. Other materials were listed in an annotated bibliography which was also given to the schools.

B. Locating and Developing Materials for the 1978-79 Program

Since the objectives of the 1978-79 Visiting Women Scientists Program were substantially the same as those defined for the pilot program, it was not necessary to conduct another complete search for existing materials. However, a number of materials which had not been available at the time of the pilot program were examined for possible use in the 1978-79 program, and some of these were included in the resource packet and List of Resource Materials.

In addition to selecting materials for use in the resource packet, RTI developed a number of materials specifically for use in the 1978-79 Visiting Women Scientists Program. Materials which were changed substantially from those developed for use in the pilot program were used in the North Carolina visits and revised from the experience of those visits. A copy of each of the

materials used in the 1978-79 Visiting Women Scientists Program, with the exception of the resource packet materials, is included in Appendix F.[3]

1. Visiting Women Scientists Program Resource Packet and List of Resource Materials

The resource packet given to schools in the 1978-79 Visiting Women Scientists Program is quite similar to the one used in the pilot program. It includes a variety of materials about career opportunities in the biological and physical sciences, engineering, mathematics and social sciences; it also includes information about financial aid. Two particularly good publications included in the resource packet deserve specific comment. The 16-page illustrated booklet Women in Science and Technology: Careers for Today and Tomorrow[4] explores some of the myths and realities about women in science, the careers available, characteristics of women in science careers, and the steps necessary to plan a successful career. I'm Madly In Love with Electricity[5] gives profiles of women in a variety of science areas and includes pictures and quotations.

In addition to listing the materials in the resource packet, the List of Resource Materials included with the resource packet contains an annotated bibliography of especially good printed materials and films. In the pilot program each participating school received one copy of the resource packet. Because a number of the pilot schools indicated they would like to receive additional resource packets, each school in the 1978-79 program was given two resource packets and the opportunity to request as many as three more copies. In addition, each school received approximately 50 copies of Women in Science and Technology.

2. Visiting Women Scientists Program Brochure

This informational brochure gives a brief overview of the purposes and scope of the Visiting Women Scientists Program. It was included with the letters to Chief State School Officers and district superintendents, information and materials mailed to women scientists, and letters mailed to school principals. The brochure was also sent to persons who contacted RTI to ask for information about the program.

3. Careers in Science and Technology: More Women Needed

This brochure has a cover resembling a "help wanted" section of a newspaper's classified advertisements; information about current and projected employment opportunities in science and technology careers is provided inside. For example, some relevant U.S. Department of Labor statistics are reported:

9 out of 10 women will work at some point in their lives; and even with a break in employment for marriage and children, the average woman can expect to work 25 years. The brochure points out that some science fields such as engineering are particularly promising for women and that, in general, opportunities for persons trained in the sciences are greater in industry than in academia. The importance of keeping one's options open by getting a good background in mathematics is stressed. Finally, several sources for obtaining additional information about careers are described. All students who attended a meeting in the Visiting Women Scientists Program received a copy of this brochure.

4. Visiting Women Scientists Program Learning Activities

A number of learning activities had been developed for use in supplementing the basic messages of the women scientists and field representatives during the pilot program. Based on experiences in the pilot program some of these activities were discarded, and much of the material in other activities was incorporated into the field representatives' introductory remarks (described in Chapter VI) and other parts of the 1978-79 program. Three of the learning activities were made available for field representatives to use in 1978-79. They were used with small groups, as time permitted, to provide additional information and to stimulate discussion about science careers and career planning.

The case study developed for the 1978-79 program describes a fictitious but fairly common situation: both the brother and sister are good students; the parents are encouraging the son to go to college to become an engineer but have not spoken to the daughter about career plans. The participants in the 1978-79 program were asked to consider what they think should happen. The field representative was prepared to use a series of questions to stimulate and/or focus the discussion.

A matching activity was developed to illustrate the diversity of science careers which are available. It was designed to be rather easy to complete so students would not get the impression that science is difficult to understand. The sciences are separated into major categories: engineering, physical science and mathematics, life science, social science, and interdisciplinary. As an example, five different tasks associated with life science are listed, and the students are asked to match each example with a title selected from a list of five types of life scientists. After the students were given time to

complete the matching activity, the field representative noted the correct responses and discussed some of the science careers with the students.

A four-page booklet, Thinking About a Career in Science and Technology: A Young Woman's Choice, was written to show students the importance of planning for a career. The booklet also presents steps for planning a career and describes some of the resources available to assist students. These include the Visiting Women Scientists Program resource packets which were given to the school, the U.S. Department of Labor's Occupational Outlook Handbook,[6] I Can Be Anything: Careers and Colleges for Young Women,[7] and school counselors. The field representative was provided with a series of slides to use in presenting this information to students when it was appropriate, and copies of this booklet were made available to the students.

5. Press Release

During the pilot program the goals of the Visiting Women Scientists Program were perceived as very timely and appropriate, which led to an unexpected number of contacts with the press. It was decided that RTI would prepare a press release to assist school personnel, field representatives, women scientists, and representatives of the media in the exchange of information about the 1978-79 Visiting Women Scientists Program. The press release is included in Appendix A.

After being reviewed and approved by NSF, the press release was sent to a representative of each district with schools participating in the 1978-79 program; copies were also sent to the field representatives for their use in contacts with members of the local press.

V. THE ROLES OF THE FIELD REPRESENTATIVE AND SCHOOL CONTACT PERSON

During the planning phase of the 1978 pilot Visiting Women Scientists Program, RTI established the roles of the field representative and the contact person to ensure that details of school visits would be successfully arranged and that logistical problems would be held to a minimum. The field representatives in the pilot program proved to be very successful and were, in almost all cases, evaluated highly by women scientists, school personnel and RTI staff. The field representative role was considered to be essential in conducting a successful Visiting Women Scientists Program that includes more than a very localized area. The school contact persons also did a very good job of arranging for the visits. With only minor changes in definition, both roles were continued for the 1978-79 program and are described below.

A. Hiring and Training the Field Representatives

In the fall of 1978, a field representative from the pilot program was hired by RTI to help with the design and conduct of the 1978-79 program; she assisted in revising procedures and materials, and acted as the field representative during the North Carolina field trials. Through this process the role of the field representative was further defined, and the field representatives' presentations to students became more structured for the 1978-79 Visiting Women Scientists Program.

Three field representatives were employed on a full-time basis for the period from January through mid-May of 1979. The field representatives were drawn from the following pools: (1) science graduate students, preferably those who had work experience in a science field; (2) recently graduated master's and doctoral students with work experience in a science field who had not yet found permanent employment; and (3) unemployed scientists who were seeking short-term employment.

The field representatives were recruited by placing an advertisement in major newspapers of each of the three metropolitan areas involved in the 1978-79 Visiting Women Scientists Program. Persons who expressed interest in the position were requested to provide copies of their résumé, including references; and selected candidates were interviewed in person by RTI staff. In making final decisions about candidates, the following factors were con-

sidered: (1) the ability to relate to women scientists and school personnel as a facilitator and coordinator; (2) the ability to relate to school officials and students in a variety of situations including public speaking, small group seminars, and media presentations; and (3) a flexible time schedule. The three women who were hired as field representatives for the 1978-79 program had various levels of science training and education.

The training session at RTI was conducted during the second week of January 1979. The field representatives were asked to complete several preliminary activities designed to acquaint them with program operations and career information during the two weeks prior to the training session (see Appendix D). Included were: activities to be used during the school visits, statistics about the career outlook in various fields, percentages of women employed in scientific fields, and average annual starting salaries for various scientific occupations. Supplemental materials were provided for the field representatives to possess a "repertoire" of examples of women's work situations with which to illustrate a number of points concerning relevant program issues.

These study activities focused on providing the field representative with a great deal of information about specific careers in science and technology, a need which became evident during the pilot program. The field representatives for the 1978-79 program received more intensive training related to specific careers in order to be adequately prepared to respond to student questions. In addition, the field representatives' presentations and program materials included more information on how to use available resources to learn more about science careers.

RTI staff also prepared materials to acquaint the new field representatives with the following: their roles in preparing women scientists and contact persons for the visits, the logistical concerns in scheduling each of the various activities in the schools, basic content and supplemental information for major presentations to students, and administrative procedures for completing all program forms. The field representatives were to read all of the materials before the training session to acquaint them with their overall tasks and responsibilities. (Training materials are included in Appendix D.)

RTI staff arranged two school visits for the week of the training session for the new field representatives to observe and participate in typical school

visits. The first visit was conducted by the field representative from the pilot program and a woman scientist who had participated in earlier North Carolina visits. The field representatives and RTI staff met following the visit to discuss all aspects of the visit and answer questions. The second visit gave each field representative an opportunity to conduct at least one meeting with students. Again, a discussion was held following the visit, and individual conferences were conducted for each field representative to hear comments and suggestions about her presentation at the school.

RTI staff arranged a series of conference calls to school contact people for the new field representatives to listen to the actual scheduling of a school visit. The field representative from the pilot program spoke with the contact person from a few of the first schools to be visited in two of the three metropolitan areas. The visits were scheduled and details discussed; also, vital information was exchanged in order for the visit to proceed smoothly. Forms prepared by RTI were used when making school arrangements to ensure that communication was clear and precise.

The field representatives spent the remaining days of the training session reviewing and studying the career materials and training manual. They also worked with RTI staff in discussing situations that might arise in the schools and possible solutions, establishing guidelines on how to deal with school personnel and women scientists, and defining procedures for maintaining effective contact with RTI. They were also able to continue calling school contact persons and women scientists for schools they would visit in the following few weeks.

Following the formal training session, field representatives spent a week studying procedures, calling RTI with questions, and calling contact persons and women scientists for their early visits.

B. The Role of the Field Representative

When the pilot Visiting Women Scientists Program was designed, it was anticipated that the field representatives would act as local liaisons, arranging the details of visits with the school contact persons and ensuring that each woman scientist was sufficiently prepared for her visits. They were to reduce the burden on participating schools and women scientists and help avoid logistical problems.

After RTI staff established a tentative date for the school visit, the designated school contact person received a letter which discussed the general parameters of the program and introduced the field representative (see Appendix C for the contact person letter). The field representative maintained telephone contact with each school contact person, often making as many as five separate telephone calls to arrange a final schedule of activities and to be sure that facilities and equipment would be ready for the visit.

RTI staff were responsible for selection of and initial contacts with women scientists, and for sending them materials which described the program and their general role in the visits. The materials provided them with the following: a list of the program objectives, a description of the various types of activities which might be conducted in the schools, background materials concerning the issues related to the program, an explanation of the types of presentations women scientists typically prepared, and information relating to reimbursement for time and expenses. (See Appendix E for woman scientist materials.)

It was the responsibility of the field representative to inform the woman scientist of the detailed schedule of activities in each of her schools and to discuss her specific roles and presentations. In preparing the woman scientist for the visits, the field representative often spoke with her two or three times by telephone and occasionally met with her for an hour or two prior to the first visit. Typically, the visit to the first school for each woman scientist was conducted as suggested by the field representative. However, once the visits began, the field representative and the woman scientist worked together in planning and revising future presentations.

In the Woman Scientist Record of Visit (Appendix E) the women scientists were asked approximately how much time they spent in preparation for the visits. The responses ranged from four hours to twenty-five hours, but the average was less than ten hours. Over half of the women scientists recorded that they had spent between six and twelve hours preparing for the visits.

During the school visit, the field representatives assisted in conducting many of the activities and worked with the school contact person to resolve any problems that occurred in connection with the visit. Field representatives also handed out materials to students and collected evaluation forms from them. After visits were made to all schools in the circuit, the field

representatives wrote personal thank-you letters to contact persons and women scientists; they also completed reports for RTI concerning the activities conducted in each school and any problems associated with the visits. (Appendix D contains a summary of field representative responsibilities, various training materials, and the forms they completed for RTI.)

C. The Role of the School Contact Person

Each school principal designated a staff member to be the contact person for the Visiting Women Scientists Program. The contact person worked with the field representative in arranging for the visit. As Table 8 illustrates, principals designated a variety of persons (including themselves in some cases) to be contact persons. Members of the school's science teaching staff (either department heads or teachers) and counselors were the persons most likely to fill this role.

Table 8

SCHOOL CONTACT PERSONS WHO HELD PARTICULAR STAFF POSITIONS

Staff Position	Number	Percent
Principal	4	3
Assistant Principal	16	11
Counselor	48	34
Science Department Head	43	31
Science Teacher	21	15
Mathematics Department Head	4	3
Mathematics Teacher	1	1
Other	3	2
Total	140	

During the 1978 pilot program RTI staff learned that, in some cases, the contact person was the only staff member who had read the preparatory literature about the program. Other staff members were often unaware of the goals and objectives of the program, or the activities planned for the visit. Consequently, some teachers were reluctant to release their students from class and some were unaware of the visitors in the school. Although many contact persons involved others in planning for the Visiting Women Scientists Program, the information received by staff was often sketchy and incomplete.

To alleviate the problem for the 1978-79 program, RTI developed a memorandum to be mailed to the contact person for distribution to school staff (Appendix C). The memorandum noted the date of the visit to the school and briefly described the major purposes of the Visiting Women Scientists Program. In addition, the visitors' names, occupations, and employers were listed, and the contact person was named as the coordinator for the program in the school. The memorandum proved to be very effective. The field representatives and women scientists repeatedly arrived at the schools to find an enthusiastic and well-prepared faculty, which often contributed to the success of the visit.

The general activities of the school contact person prior to the visit were: communicating with RTI staff to affirm the date of the visit; working with the field representative to arrange for facilities, equipment, and other details; distributing memoranda; and communicating with staff in preparation for the visit.

The School Contact Person Record of Visit (Appendix C) asked how much time was spent arranging for the visit (scheduling; talking to teachers, corresponding with the visitors, etc.). The responses, shown in Table 9, indicate that most contact persons spent from two to five hours arranging for the visit, but a few spent considerably more time; sixteen contact persons reported spending more than ten hours.

Table 9

AMOUNT OF TIME SPENT BY SCHOOL CONTACT PERSONS TO ARRANGE THE VISITS[1]

Time Spent	Number of Contact People	Percent
Less than 2 hours	21	16
2-5 hours	70	52
6-10 hours	27	20
More than 10 hours	16	12
Total	134	

[1] Does not include six schools for which this information was not provided.

In addition to spending time arranging the visits, most school contact persons also spent a considerable amount of time working with the field representative and the woman scientist during the visit. They often were busy arranging for students to attend sessions, attending the staff meeting, obtaining necessary equipment and facilities, and accompanying the visitors through unfamiliar surroundings.

The contact persons participating in the 1978-79 Visiting Women Scientists Program responded with very favorable comments regarding the program. Among them were:

> "...I believe in its goals (VWSP) and I feel it is effective in reaching them...;"
>
> "...the program exceeded my expectations...;"
>
> "I was highly impressed with the presentation, especially the way individual students' needs were met;" and
>
> "Excellent balance of audio-visual media/demonstration/lecture and cooperative inquiry."

One contact person suggested that the order of presentations should be switched; that is, the visiting scientist should speak first, and then the field representative. Another requested that visitors spend more than one day at each school in order to provide all students with an opportunity to interact with the women scientists.

Approximately one month after the visit, the contact persons were asked to complete a follow-up form describing any evidence of the impact of the Visiting Women Scientists Program (Appendix C). Among the comments on this form were the following:

> "...course registration for 1979-80 (school year) shows an increased interest in upper level science/math courses over last year;"
>
> "...student feedback has been positive;"
>
> "...actually, the greater impact has been on faculty--making them more aware of the opportunities for women...;" and
>
> "This was the most encouraging program our girls have ever experienced. It opened their minds to career opportunities they generally felt inadequate about considering."

D. Evaluation of the Field Plan: Use of the Field Representative and School Contact Person

Data collected in the 1978 pilot program indicated that the use of field representatives and school contact persons worked very well; similar results were obtained from data collected in the 1978-79 program. Women scientists were asked to rate the performance of the field representative who accompanied them to their schools (Woman Scientist Record of Visit in Appendix E). The response is shown in Table 10.

Table 10

WOMEN SCIENTISTS' RATINGS OF FIELD REPRESENTATIVES

	Percent			
Category	Excellent	Good	Fair	Poor
Preparing you for the visits	64	34	2	0
Working with you on the days of the visits	82	18	0	0
Interaction with school personnel	78	18	4	0
Interaction with students	80	16	4	0
Knowledge of various careers	66	30	2	2

Although these ratings were made with reference to the performance of specific field representatives, they also reflect upon the role being fulfilled by these persons. In fact, when asked to comment upon the performance of the field representative, many women scientists made comments relating to the various aspects of the role of the field representative. Some commented about the logistical support which allowed them to concentrate on their presentations and avoid problems. Others appreciated the briefing they received about the program in general and about the specific characteristics of each school, based upon communication between the field representative and the school contact person. Some also remarked favorably about the way field representatives related with school personnel and about the diversity that was added by having a second woman scientist present to help with the presenta-

tions. The following comments made by women scientists were particularly relevant to the planned role of the field representative.

> "....I have done quite a bit of volunteer work of this nature in the past, and have often had trouble being met (the office did not know I was coming, etc.) and also arranging in advance just what was expected of me (what materials to bring). It was most pleasant having someone to smooth the way for me, and to get treated like a V.I.P. at the schools. The schools couldn't have been nicer or more helpful...."

> "....I felt the field representative was valuable in having some advance preparations, in knowing how to change pace when it was needed; she made the parts of the visiting scientist much more easily accomplished--at times, acting as a good 'interface.' The combination of one or two scientists and the field representative is worth retaining...."

The school contact persons were asked to rate the field representative in terms of four dimensions (School Contact Person Record of Visit in Appendix C). Their ratings of the field representatives are shown in Table 11.

Table 11

SCHOOL CONTACT PERSONS' RATINGS OF FIELD REPRESENTATIVES

	Percent				
Category	Excellent	Good	Fair	Poor	No Response
Working with you in scheduling visit	80	14	1	0	5
Interaction with students	71	20	3	1	5
Knowledge of various careers	67	22	4	0	6
Enthusiasm about program	89	6	1	0	4

n = 140

Similarly, with only a few exceptions, the school contact persons did a very good job of arranging for the visit. The field representatives and the RTI site visitors reported that in most cases the schools were very well prepared for the visit. For example, there were few instances when teachers did not know their students were to participate or when needed equipment and facilities were unavailable.

VI. PROGRAM OPERATIONS

Between November of 1978 and May of 1979, 51 women scientists visited 140 junior high and high schools in four areas of the United States. The women scientists, accompanied by one of four specially trained RTI field representatives made presentations to more than 24,000 students including over 23,000 females and nearly 900 males. This chapter describes the types of meetings which comprised the school visits.

A major purpose of the pilot program was to make tenth grade females aware of the potential for women in science careers at a time when they could still redirect their high school program to include more mathematics and science. For eleventh and twelfth grade females the purpose was to reinforce their interest in science careers. A number of contact persons and women scientists who participated in the pilot program suggested expanding the program to other grades, including the entire range from elementary school through college. While no program would be suitable for all audiences, the Visiting Women Scientists Program was considered to be particularly valuable for ninth graders. Therefore, plans for the 1978-79 program included ninth graders from junior high and high schools.

An additional modification for the 1978-79 program was the emphasis placed on arranging all-female group meetings. The pilot program had included some male and female groups to promote the attitude among both that science careers are appropriate for women as well as men. However, when male students were present, females rarely raised questions concerning the problems associated with combining family lives and science careers. In addition, the males often dominated the discussions about science careers, thus reinforcing the notion that science is a male's domain.

A. Types of Meetings

After the visit date was scheduled by RTI staff, a letter was sent to the designated contact person describing various types of meetings. The field representatives then worked with the contact persons by telephone in arranging the specific meetings to be conducted during the visit. (The contact person letter is in Appendix C.) The types of meetings which were included in the 1978-79 program are discussed below.

1. Large Group Meetings

Schools were asked to arrange a large group meeting for their ninth and tenth grade female students, and 111 schools (79 percent) arranged such a meeting. Large schools sometimes selected a portion of their ninth or tenth grade females for the meeting, or they arranged two or more separate meetings. Some high schools also included students from grades 11 and 12 in [illegible] group meetings, and a few junior high schools invited seventh and eighth grade females. The general approach in the large group meetings was to efficiently provide a large number of students an opportunity to meet a woman scientist role model and to show them examples of women in a variety of science careers.

The field representative began the meeting by distributing copies of Careers in Science and Technology: More Women Needed, a pamphlet developed to emphasize some of the major messages of the Visiting Women Scientists Program. She then proceeded with a prepared introduction which included the following points: (1) most women work; (2) without proper planning women may have to stay in low-paying, unskilled jobs; (3) there are many opportunities for women in the sciences; and (4) while you do not need to be a genius to succeed in a science career, you do need to take the necessary prerequisites. (An outline of the Field Representative's Introductory Remarks is included in Appendix D.)

As part of the 15-minute introduction the field representative showed a series of slides of women scientists representing a diversity of science fields, types of employment, ages, life styles, and race or ethnic backgrounds. These slides were used to illustrate a number of points including: women scientists work on many kinds of tasks in a variety of settings, scientists are often involved in finding solutions to important societal problems, and women scientists have combined successful careers with personal lives in a number of different ways.

The woman scientist was then introduced, and she usually took about 15-20 minutes for her presentation. There was a great deal of variation in these presentations, depending upon the area of science and the personality of the particular woman. During the 1978 pilot program, it was clear that women scientists who brought "hands on" demonstrations or slide presentations were generally more successful in gaining student attention than visitors without demonstrations. Therefore, the initial letter to participating women scien-

tists gave examples of successful demonstrations from the pilot program and urged them to prepare illustrative demonstrations. The field representatives were also encouraged to indicate in their conversations with women scientists that a demonstration of their work would be highly desirable. As a result, women scientists' prepared more demonstrations for the 1978-79 program than they had for the 1978 pilot program.

Many women scientists prepared demonstrations related to their jobs. For example, a physical scientist brought a laser and optical fiber to illustrate the technological advantages of lasers in telephone and telegraph communication. An engineer gave four simple demonstrations to illustrate that basic scientific principles are not difficult to understand. She demonstrated fluidization of a solid, a functioning solar cell, the process for an oil spill clean-up, and displacement of air and water. In addition, she brought her hard hat, safety glasses and gloves, allowing the girls to try them on as an "icebreaking" technique. An anthropologist portrayed the various specializations in her field by bringing artifacts (to illustrate archaeology); skulls (physical anthropology), turkish coffee maker (cultural anthropology), and examples of language texts (linguistics).

As additional examples, some students were shown slides of pollution sites, fossil research in the field, and insects as seen through an electron microscope, while some saw demonstrations of luminescence, fluorescence and phosphorescence. Other students saw a demonstration of a "talking" computer, samples of processed food used by NASA in space flights, and pictures of the inside of a nuclear power plant. Some women included slides of themselves at home with their families and friends or enjoying their recreational activities.

In addition, the women scientists told the students about their education, training and personal backgrounds. Many related how they happened to choose a scientific career; some had aspired to such careers from an early age while others seemingly stumbled into them or made later career decisions. Some talked about the problems associated with combining a career in science with a family and the ways in which they resolved these problems.

After the woman scientist had completed her presentation, the field representative usually informed the students of sources for seeking additional information about science careers and the importance of early planning for a career. (The following sources were described: Occupational Outlook Handbook, Thinking About A Career in Science and Technology: A Young Woman's Choice ,

I Can Be Anything: Careers and Colleges for Young Women, and resource packet materials.)

2. Follow-Up Meetings

In 77 percent of schools in which a large group meeting was conducted there was at least one follow-up meeting of approximately 30 females, who had attended a large group meeting. In nearly 30 percent of the schools, two or more follow-up meetings were conducted.

The objective of the follow-up meetings was to make informal sessions available to ninth and/or tenth grade females who had attended the large group meeting and who were particularly interested in exploring science career possibilities. Some participants in the follow-up meetings were chosen by school staff members based upon demonstrated interest and ability in science and mathematics; others were self-selected, using procedures developed by the contact person. The major purposes of the follow-up meetings were (a) to establish and reinforce the notion that women can be interested and successful in science careers, and (b) to provide specific information in response to students' questions.

The field representative established an atmosphere of informality. She usually gave a brief overview of the major points from the large group meeting, and she often distributed and conducted one of the program learning activities developed specifically for the 1978-79 program (see Chapter IV).

The field representative generally used about 15-20 minutes and then turned the program over to the woman scientist for about 20 minutes. If the woman scientist had a demonstration other than the one used in the large group meeting, she would often open her presentation with it. If not, she might describe her job in more detail, including anecdotes of experiences in her science career.

The field representative usually allowed approximately ten minutes for questions directed to her and the visiting scientist. In closing, the field representative gave each participant an opportunity to obtain a copy of Thinking About a Career in Science and Technology: A Young Woman's Choice. She usually described the pamphlet and encouraged the participants to utilize this and other sources in seeking additional information about science careers.

3. Seminars

High schools were encouraged to schedule one or more seminars for approximately 25 females from grades 11 and 12. Since juniors and seniors

could not so easily redirect their high school programs to include more mathematics and science, school personnel were encouraged to invite or select female students who were particularly interested in a science career, or who were taking electives in mathematics and science. As in the follow-up meetings, the major purposes of these seminars were (a) to reinforce the notion that women can be interested and successful in science careers, and (b) to provide specific information in response to the students' questions.

Most schools (77 percent) arranged at least one all-female seminar, and many schools (61 percent) arranged two or more. These seminars varied a great deal in size, depending upon interest and facilities, and some schools involved sophomores as well as juniors and seniors. Participation was limited in some schools to females taking elective mathematics and science courses; other schools allowed the students to decide whether or not they wanted to attend.

The field representative distributed copies of Careers in Science and Technology: More Women Needed to all participants and then gave a brief version of the structured introduction and slide presentation used for the large group meeting. After about 15 minutes the woman scientist was introduced, and she conducted the seminar for the next 20-25 minutes. If the woman scientist had prepared a demonstration or some type of slide presentation, she often opened her presentation with it, as in the large group meetings. In these all-female settings the women scientists were likely to add a discussion of the problems associated with combining a successful career and a family, using personal examples or those of a colleague.

The points of emphasis varied, but there were certain overriding themes which were generally covered in each seminar: more women are entering the traditionally male fields of science and engineering; because of new attitudes and federal laws there are many opportunities for women in the sciences; one does not have to be a genius to succeed in a career in science or engineering, but high school females should definitely take electives in science and mathematics in order to have the option of entering these careers later.

The field representative usually allowed approximately ten minutes for questions to the woman scientist and herself. The field representatives in the 1978 pilot program reported that the eleventh and twelfth grade females often had more questions than the younger students; hence, field representatives were urged to ensure that sufficient time was allotted for questions

during seminars. The field representative then gave each student the opportunity to obtain a copy of Thinking About A Career in Science and Technology: A Young Woman's Choice and urged the participants to utilize available information sources in beginning to plan for a career, as described above for large groups.

4. Staff Meetings

There were some operational difficulties associated with scheduling and conducting the staff meetings during the 1978 pilot program; thus, modifications were made for this activity during the 1978-79 program. In the pilot program, the contact person had been requested to arrange a meeting between the visiting scientists and school staff, including the following: guidance counselors, science, mathematics, and social science teachers, librarians, and other interested personnel. Participants often learned little about the purposes of the Visiting Women Scientists Program prior to the meeting; some were unable to attend during regular school time, and teachers often resented the loss of class time. In addition, the field representative did not have an established set of guidelines or a structured presentation to use in conducting the meeting.

For 1978-79 the presentation by the field representative was brief and more structured. Field representatives were also more flexible in scheduling the meeting to make it possible for many staff members to attend, e.g., before school, during lunch, or after school. Also, the contact person received copies of a descriptive memorandum for distribution to school staff members prior to the meeting.

The major purposes of the meeting were: (1) to describe the purposes of the Visiting Women Scientists Program; (2) to describe the types of meetings conducted and the information presented: (3) to acquaint them with the resource packet and other reference materials that might be of value to females; and (4) to encourage them to be sensitive to the purposes of the program and to reinforce the ideas after the visit.

Because of operational problems associated with school schedules, a staff meeting took place in only 97 of the 140 schools (69 percent). The staff positions represented in the meetings are shown in Table 12. Counselors and science teachers were represented in over three-fourths of the meetings; mathematics teachers and librarians attended about half of the meetings; and social science teachers were represented in about one-third of the meetings.

Table 12

SCHOOL STAFF POSITIONS REPRESENTED IN THE NINETY-SEVEN STAFF MEETINGS

Staff Position	Number of Times One or More Were Present	Percent
Counselor	81	84
Librarian	45	46
Science Teacher	75	77
Mathematics Teacher	51	53
Social Science Teacher	28	29
Principal	28	29
Vice Principal	26	27
Other	34	35

To initate the staff meeting, the field representative usually introduced herself and the woman scientist, who very briefly described her area of science and occupation. Participants were then asked to introduce themselves and identify their teaching area or staff position. The field representative gave a brief overview of the Visiting Women Scientists Program and reiterated the major points of the program to be presented to participating students. This part of the presentation was concluded by stating that she hoped the interaction among the role models and students, along with the information and materials provided by the program, would help influence the students in their career planning. It was emphasized that the message for students was not to choose a specific career at this time, but to consider science careers and take as many high school mathematics and science courses as possible to keep their options open. Since a one-day program cannot accomplish this by itself, a major purpose of the staff meeting was to enlist the help of the school staff in encouraging female students to consider careers in the sciences. (The sample narrative for the staff meeting is in Appendix D.)

The field representative then discussed resources for the students including the Occupational Outlook Handbook, I Can Be Anything: Careers and Colleges for Young Women and the Visiting Women Scientists Program resource packet. The resource packet materials were shown to participants and briefly described. The field representative referred the participants to two particularly good

publications, I'm Madly In Love With Electricity and Women in Science and Technology: Careers for Today and Tomorrow. She mentioned that the packets not only had pamphlets about specific areas of science, but also information about financial aid. The field representative often distributed copies of the List of Resource Materials explaining that teachers might assist their students by referencing a relevant publication in the packet.

Having previously determined where the contact person would place the two resource packets provided to the school, the field representative informed the participants of the locations. Most schools decided to keep the packets in the guidance center, counseling office, or library; some schools felt that the office of the science department chairperson would be an appropriate place for the packets. The field representative also noted requests for additional resource packets to be sent to the school.

In closing, the field representative informed school personnel of RTI's development of the Women Scientists Roster, a roster prepared at the suggestion of educators who participated in staff meetings during the 1978 pilot program. Finally, the teachers were urged once again to reinforce the Visiting Women Scientists Program efforts by encouraging their female students to take the necessary mathematics and science courses to ensure the option of pursuing a science-oriented career.

When it was possible, field representatives provided some time for questions and discussion. The staff meetings often sparked meaningful discussion among teachers, counselors, and the visitors. Many teachers were keenly aware of the importance of career education in the high school years and showed a desire to learn about career opportunities.

B. Meetings Conducted

The types of meetings scheduled in schools during the 1978-79 Visiting Women Scientists Program varied to accommodate specific school schedules and preferences. Table 13 on the following page shows the frequency of the various types of meetings across schools. More than 24,000 individual students were seen in the three formal meetings: 16,334 in large groups (13,189 of whom were ninth or tenth grade females), and 7,867 in seminars. In addition, 4,608 of these students attended follow-up meetings after attendance at a large group meeting.

Table 13

PARTICIPATION IN LARGE GROUP MEETINGS,
FOLLOW-UP MEETINGS AND SEMINARS

Type of Meeting	Number of Schools With Each Number of Meetings of Each Type							Schools With At Least One Meeting of Each Type	Total Number of Meetings of Each Type	Total Number of Students Seen In Each Type of Meeting	Average Number of Students Per Meeting
	1	2	3	4	5	6	7				
Large Group	83	22	4	0	1	1	0	111	150	16,334	109
Follow-up	45	17	12	6	4	1	0	85	165	4,608	28
Seminar	23	35	19	17	4	8	2	108	300	7,867	26
						TOTAL		140	615	24,201[1]	40

[1] Does not include 201 students seen in 11 other types of meetings.

At least one large group presentation was conducted in 111 schools. In all, there were 150 large group meetings with an average attendance of 109 students per meeting. There was a total of 165 follow-up meetings in the 85 schools which scheduled them, with an average of 28 students per meeting. There were 300 seminars in 108 schools, with an average of 26 students per session.

Including all schools, there was an average of more than four meetings with students per day (615 meetings in 140 schools). Adding the 97 staff meetings to the total, the average number of meetings per day was over five (712 in 140 schools). (These figures do not include informal contacts with individual students, principals, and contact persons.)

Table 14 shows the combination of seminars, large group meetings, and follow-up meetings conducted in schools. All three types of meetings were scheduled in 56 schools. Seven of the schools which scheduled multiple large group meetings had both follow-up meetings and seminars; and three schools with multiple large groups had neither follow-up meetings nor seminars.

Table 14

COMBINATIONS OF SEMINARS, LARGE GROUP MEETINGS AND FOLLOW-UP MEETINGS

	No Large Groups	One Large Group	Two or More Large Groups	Total
No Follow-ups, One or More Seminars	29	[illegible]	7	52
No Seminars, One or More Follow-ups	0	18	11	29
One or More Seminars, One or More Follow-ups	0	49	7	56
No Follow-ups, No Seminars	0	0	3	3
TOTAL	29	83	28	140

VII. THE WOMEN SCIENTISTS ROSTER AND THE MANUAL ON PROGRAM OPERATIONS

A. The Women Scientists Roster

A roster of approximately 600 women scientists interested in visiting high schools was developed for the 1978 pilot Visiting Women Scientists Program. Names of women scientists for the roster were obtained by mailing information about the program to:

(1) samples from lists of women on available rosters professional science organizations such as the American Astronomical Society and the American Statistical Association;

(2) women recommended by people in various disciplines and organizations such as the American Chemical Society's Women Chemists Committee;

(3) women scientists portrayed in various articles, pamphlets, etc., such as Space for Women and I'm Madly in Love with Electricity;

(4) women included on registration lists of the national conventions of the Society of Women Engineers and the Engineering Foundation; and

(5) respondents who requested more information after reading an announcement of the program placed in various newsletters, such as The NSF Bulletin and The Association for Women in Science Newsletter.

As a result of suggestions from school personnel and women scientists who participated in the pilot program, it was determined that a national Women Scientists Roster would be developed for the use of schools, districts, and organizations interested in conducting similar programs. This roster includes approximately 1,300 women scientists who are interested in encouraging females to consider science careers. It includes women from the 50 states, Canada, Puerto Rico, and the District of Columbia. Represented are women from all areas of science and a variety of educational, employment, and race or ethnic background categories.

The roster was developed by contacting nearly 900 women who had expressed interest in participating in the pilot program. Then, during the fall of 1978 and spring of 1979 the roster's development was announced in the NSF Bulletin and other professional publications. Women interested in being on the roster were asked to return information to RTI.

The Women Scientists Roster consists of two lists. One is ordered alphabetically by last name and contains all available information about each woman: name, mailing address, phone number, general area of science, specific science field, highest degree, 1978 employment, and race or ethnic background. The second list is ordered alphabetically by state, numerically by zip code, then alphabetically by last name. This list also shows the city, general area of science, and race or ethnic background of each woman.

The following tables show the composition of the roster. See Appendix G for the formats of the lists, the Roster Form, and the announcement of the roster's development.

Table 15

WOMEN SCIENTISTS ROSTER--
AREA OF SCIENCE

	Number	Percent
Biological Science	351	27
Physical Science	419	33
Engineering	196	15
Mathematics	135	11
Social Science	180	14
Unknown	5	<1
Total	1,286	

Table 16

WOMEN SCIENTISTS ROSTER--
HIGHEST DEGREE OBTAINED

	Number	Percent
Bachelor's Degree	215	17
Master's Degree	758	59
Doctorate	305	24
Other	8	1
Total	1,286	

Table 17

WOMEN SCIENTISTS ROSTER--
RACE OR ETHNIC BACKGROUND

	Number	Percent
American Indian or Alaskan Native	5	<1
Asian or Pacific Islander	33	3
Black	64	5
Hispanic	16	1
White	848	66
Unknown	320	25
Total	1,286	

Table 18

WOMEN SCIENTISTS ROSTER--
TYPE OF EMPLOYMENT

	Number	Percent
Academic	746	58
Non-Profit Organization	74	6
Profit-Making Organization	321	25
Government	136	11
Unknown	9	1
Total	1,286	

The roster will be available through the National Science Teachers' Association at 1742 Connecticut Avenue, N.W., Washington, D.C. 20009. A copy of the roster will be mailed to each of the 250 schools which participated in the Visiting Women Scientists Program as well as to state science, mathematics and social science supervisors in the 50 states.

B. The Manual on Program Operations

Through the pilot and 1978-79 Visiting Women Scientists Programs, RTI gained considerable knowledge about planning and implementing school visits by women scientists to junior high and high schools for the purpose of encouraging female students to consider careers in science and technology. RTI is also aware that a number of other organizations across the country including

university-based groups, school districts, and professional societies have shown interest in conducting similar programs. The manual on program operations describes in detail the materials and procedures used in conducting the Visiting Women Scientists Program. Steps which can be taken to avoid potential problems are emphasized, and there is a discussion of procedures and materials which were discontinued or revised because they proved to be ineffective or problematical. The manual was designed to share the experience gained through two years of the Visiting Women Scientists Program with others who may wish to design or conduct similar programs in which woman scientist role models contact female students.

RTI will send a copy of the manual to the 250 schools which participated in the Visiting Women Scientists Program and to state science, mathematics and social science supervisors in the 50 states. RTI will also submit the Manual on Program Operations to the National Technical Information Service (NTIS) and the Educational Resources Information Center (ERIC).

VIII. DATA COLLECTION

A number of forms were used to gather information about the 1978-79 Visiting Women Scientists Program from students, school personnel, women scientists, and field representatives. The forms and procedures used to collect these data are described in this chapter. The results of the program are described in Chapter IX.

A. Schools Visited in 1978-79

Principals at selected junior high schools in Minnesota and Pennsylvania and high schools in California, Minnesota and Pennsylvania were sent an introductory letter and a Principal Form (see Appendix B) to return to RTI if interested in participation. A visit was then scheduled with each interested school according to dates suggested on that form. Prior to the visit, the contact person received an explanatory letter and materials and was asked to complete and return a School Information Form which determined the following: the number of copies of a memorandum to be sent for distribution to school staff; problems with the scheduled visit date; and school characteristics such as enrollment, location, and minority breakdown.

At the time of the visit, the contact person at each school was given a Record of Visit form to return to RTI. This form asked about the time spent in making arrangements for the visit, the performance of the field representative, and any problems encountered. A month after each visit, a Follow-Up Questionnaire was sent to the contact person in each school. It asked about the value of the Visiting Women Scientists Program, the use of the resource packet, ordering of other materials, any evidence of the program's impact, and whether the school would be interested in participating again. A postage-paid envelope was provided for the return of each of these forms. The contact person materials are included in Appendix C.

A reminder note, with additional forms and another postage-paid envelope, was mailed to schools which did not return their original forms. During the last month of the school year, schools were called (several calls were often necessary) to attempt to obtain the needed information from forms not yet received by RTI.

School Contact Person Record of Visit forms were completed by all but six of the 140 schools visited (96 percent response rate), and the Follow-Up

Questionnaires used to evaluate the impact of the program were obtained from 108 of the 140 schools (77 percent). Information about school characteristics was obtained from School Information Forms for 133 of the 140 schools (95 percent).

B. Students

In seminars and follow-ups to the large groups, field representatives requested that each student complete a Student Form (see Appendix D). The students were to indicate their grade and sex, their rating of the Visiting Women Scientists Program, the program's value to them in various ways, and the parts of the program they liked best. The questionnaires were collected by the field representative at the end of the session and returned to RTI. Completed questionnaires were received from 10,790 students.[8]

C. Field Representatives

Each of the four field representatives[9] was responsible for documenting her school visits. For each meeting with students, the field representative completed a Meeting Activity Record describing that meeting. In addition, she completed a Visit Record for each school, which provided the following: the number and type of personnel attending the staff meeting, the location of the resource packets, the types of meetings held, the number of students attending, and any problems experienced during the visit. The Field Representative Visit Records and Meeting Activity Records were returned to RTI along with the student questionnaires following each week of visits.

Field Representative Evaluation Forms were sent to the field representatives at the program's completion. On these forms the field representatives summarized their ideas about various aspects of the program including the field trial visits, the forms used and procedures employed, the activities conducted, the effectiveness of particular types of meetings, problems encountered in conducting and scheduling visits, the roles of women scientists, and their role as field representative. All field representative materials are included in Appendix D.

D. Women Scientists

Each woman scientist filled out an application form which asked about her area of science, educational background, employment, and race or ethnic background.

A Woman Scientist Record of Visit and a postage-paid envelope were included with materials sent to the women scientists prior to their visits. This form, to be completed after the school visits, asked about the amount of preparation time, the demonstration that they prepared for their visits, their perception of the field representative, their interest in future participation, and any suggestions they might have for improving the program. Woman scientist materials can be found in Appendix E.

E. Site Visits

In addition to maintaining close telephone contact with the field representatives, RTI staff attended several visits of each field representative. The purposes of these site visits were (1) to monitor the performance of the field representatives, and (2) to evaluate field procedures and make revisions as necessary.

RTI staff observed visits to 21 schools, and the NSF project officer accompanied the central staff on two of these visits. Two North Carolina schools were visited by RTI staff during the field representative training session. Four other North Carolina visits were observed during November and December, and fifteen visits were observed in California, Minnesota, and Pennsylvania during the period January through May.

F. 1978 Pilot Program Follow-Up

Schools which were visited in the 1978 pilot Visiting Women Scientists Program were recontacted early in 1979 to determine if there was any evidence of the program's impact approximately one year after the visit (for control schools, one year after receiving the resource packet and postcards). A brief questionnaire was used to determine the following: if the number of females seeking information about science careers had increased; if the resource packet had been used; if a larger number of females were enrolled in elective science and mathematics courses; and for visited schools, whether they would be interested in participating in the Visiting Women Scientists Program if it again became available in their area. The 1978 pilot program follow-up questionnaires are included in Appendix H.

Completed questionnaires were obtained from 75 percent of visited and 63 percent of control schools. Though telephone follow-up was made to each school, school staff members at several schools indicated that they did not know this specific information, while others said they were not at the school the previous year and knew nothing of the program.

IX. EVALUATION OF THE VISITING WOMEN SCIENTISTS PROGRAM

A. Introduction

While an important purpose of the Visiting Women Scientists Program was to provide information about women in science careers, it was clear that one or two sessions with a woman scientist could provide students with only a limited amount of information about science careers. Consequently, encouraging high school females to seek additional information and assisting them in their research became major goals of the pilot program. Experimental-control group comparisons were used to measure these goals in the 1978 pilot program, and the evaluation showed that the Visiting Women Scientists Program was successful in encouraging tenth grade females to seek additional information about women in science careers and encouraging the use of the resource packets provided to the schools.

There was no experimental-control group design for the 1978-79 program, but various data were collected from those who participated. This chapter examines the effectiveness of the 1978-79 program by investigating data provided by students, women scientists, and school contact persons about the value of the program.

B. Female Students Seeking Information, Use of the Resource Packets, and Other Evidence of Impact

Approximately one month after the visit, the contact person at each school was asked to complete a brief questionnaire about the impact of the Visiting Women Scientists Program and the use of the resource packets. This questionnaire is included in Appendix C.

Fifty-nine percent of schools indicated that more than the usual number of female students had sought information about science careers; 41 percent indicated that the number of females seeking science career information was about the same as usual.

Contact persons were also asked if the resource packets had been used by each of a number of types of people, as listed in Table 19. Eighty-one percent of the schools reported that the resource packets had been used by at least one of these groups; eight percent indicated they had not been used, and an

additional eleven percent indicated that they did not know if they had been used.

Use of the resource packets by particular categories of people is shown in Table 19. A majority of the schools (77 percent) indicated that some students had used the resource packets. Some counselors had used the resource packets in 57 percent of the schools, and some teachers had used them in 51 percent of the schools. Very few of the schools reported that any administrators had used the resource packets.

Table 19

USE OF THE RESOURCE PACKETS

	Percent of Schools in Which the Resource Packets Were Used by:
Students	77
Teachers	51
Counselors	57
Librarians	22
Administrators	6
Others	6

Although most schools had used the resource packets, relatively few of them had ordered any of the materials listed in the resource packets or the List of Resource Materials. Only 17 percent of the schools indicated that they had already ordered materials, but another 50 percent indicated they had plans to order materials.

Contact persons were asked to describe any evidence of the impact of the Visiting Women Scientists Program on students, teachers, counselors, or others. Many contact persons suggested that a great deal of enthusiasm was generated by the visitors. Several mentioned that there had been an increase in the number of females signing up for higher level science courses. Also, the resource materials were very well received. One contact person wrote:

> "There was a great appreciation of the availability of the materials, resources, and ... speakers from both students and faculty. Certainly there was greater awareness of the possibility of a career in science among the students."

The idea of increased student awareness about science careers was mentioned by a number of schools. In some, clubs were being started for women in science or engineering; others had written articles in their school newspaper or made displays for appropriate bulletin boards.

Another very important impact mentioned was increased teacher awareness. Some schools reported that teachers were conducting lessons in career guidance, and others suggested that their faculty had been made "...more aware of opportunities for women." Also suggested was the opening of communication channels between students, teachers, and counselors. One comment from a junior high school reflects many schools' attitudes.

> "This was the most encouraging program our girls have ever experienced. It opened their minds to career opportunities they generally felt inadequate about considering."

C. Student Evaluations of the 1978-79 Visiting Women Scientists Program

Students who participated in seminars or follow-up meetings were asked to complete a brief evaluation questionnaire; a copy of this questionnaire is included in Appendix D. Student evaluation of the program as a whole, as well as their reactions to particular aspects of the visits, are presented below.

Table 20 shows the students' responses to the question "How would you rate this Visiting Women Scientists Program overall?" broken down by sex and grade.[10] The visits were generally well received, with 92 percent of students rating the program either excellent or good; less than one percent considered the program poor. Not surprisingly, a larger percentage of females than males considered the program excellent (38 and 33 percent, respectively). For females, the percent of students rating their meeting excellent tended to increase with grade range. Thirty-four percent of ninth graders rated the program excellent compared to 39 percent of tenth graders, 40 percent of those in eleventh grade and 43 percent of twelfth graders. However, it should be noted that many of the participating juniors and seniors had been chosen specifically for their demonstrated interest in science, and this undoubtedly affected the ratings.

The 1978-79 Visiting Women Scientists Program was conducted by four different field representatives and 51 different women scientists; and student ratings varied to some extent according to which visitors they observed.

Table 20
STUDENT RATINGS BY SEX AND GRADE[1]

Female	Number of Students[2]	Percent of Students Rating the Program			
		Excellent	Good	Fair	Poor
Grade 7	115	33	58	9	0
Grade 8	265	33	52	13	2
Grade 9	2,784	34	56	9	1
Grade 10	2,647	39	53	8	0
Grade 11	2,788	40	54	5	0
Grade 12	1,779	43	52	5	0
Total Females	10,378	38	54	7	0
Male					
Grade 7	1	-	-	-	-
Grade 8	-	-	-	-	-
Grade 9	24	38	46	17	0
Grade 10	87	38	49	11	1
Grade 11	52	35	52	13	0
Grade 12	63	22	63	14	0
Total Males	227	33	53	13	1
Total Students	10,645[3]	38	54	7	0

[1] Does not include 133 females and 6 males who filled out forms but did not rate the program, 25 females who did not indicate grade, and three females and one male who did not indicate rating or grade.

[2] Does not include 12 students who filled out forms but did not indicate their sex, and five students who did not indicate sex, and rating or grade.

[3] Totals include students who did not indicate their sex or grade, but do not include 145 students who filled out forms but did not rate the program. Also, forms from three Philadelphia schools were lost in the mail.

Table 21 shows student ratings of the program broken down by field representative. While there is some variation in the ratings, the vast majority of the students visited by each field representative rated the program either excellent or good (90 to 97 percent).

There was no discernible pattern of program ratings based on the characteristics of the women scientists who participated in the program. When analyzed separately for each of the 51 women scientists, the percent of students rating the program excellent varied considerably, from 9 percent to

Table 21

STUDENT RATINGS BY FIELD REPRESENTATIVE[1]

Field Representative	Number of Students	Percent of Students Rating the Program			
		Excellent	Good	Fair	Poor
1	3,197	38	53	8	0
2	3,125	43	51	6	0
3	3,454	31	59	9	1
4	869	50	47	3	0

[1] Does not include 145 students who filled out forms but did not rate the program.

73 percent; and the percent rating the program either excellent or good varied from 73 to 100 percent, with the majority falling in the 90 to 100 percent range. However, the group of scientists with the highest ratings and the group with the lowest ratings each included women from a variety of science areas, types of employment, ages, and degree levels.

As discussed earlier, the Visiting Women Scientists Program included three basic types of meetings: large group meetings, follow-up meetings, and seminars. Table 22 shows that students who attended follow-up meetings were a little more likely to rate the program excellent than were those who attended seminars, but the percent rating those meetings excellent or good was the same (92 percent).

While students in large group meetings were generally not asked to complete questionnaires, the field representatives and RTI site visitors felt that the large group was the least effective type of meeting. However, the more highly structured presentations used in the 1978-79 program generally increased their effectiveness, according to those involved in both programs.

In addition to rating the Visiting Women Scientists Program as excellent, good, fair, or poor, students were asked to indicate the parts of the program they particularly liked. Table 23 shows that the students rated "learning about careers for women in science" most highly, as 65 percent liked that part of the program very much and 32 percent liked it somewhat. However, the woman

scientists' talks were also very highly rated, and all aspects of the program were well received.

Table 22

STUDENT RATINGS BY TYPE OF MEETING[1]

Type of Meeting	Number of Students	Percent of Students Rating the Program		
		Excellent	Good	Fair
Follow-Up	3,907	41	51	8
Seminar	6,157	37	55	7

[1] Does not include 145 students who filled out forms but did not rate the program.

Table 23

PARTS OF THE PROGRAM STUDENTS PARTICULARLY LIKED

	Percent of Students				
	Did Not Like	Liked Somewhat	Liked Very Much	Did Not Apply	Missing
Women scientists' talks	3	42	52	0	3
Slides of women in various science careers	4	49	38	4	5
Learning about careers for women in science	2	31	62	1	3
Opportunity to have questions answered	3	37	51	5	4

n = 10,790

Students were also asked to rate the value of certain aspects of the program. These results are shown in Table 24. The program was rated either

somewhat valuable or very valuable in each of the five ways by at least 91 percent of the students. As measured by the percent of "very valuable" responses, the Visiting Women Scientists Program was most successful in communicating the importance of keeping one's options open by taking mathematics and science in high school; there were also particularly high proportions of "very valuable" ratings for encouraging students to seek further information, and showing that women can successfully combine careers and family lives.

Table 24

STUDENT RATINGS OF THE VALUE OF
ASPECTS OF THE VISITING WOMEN SCIENTISTS PROGRAM

	Percent of Students			
	Not Valuable	Somewhat Valuable	Very Valuable	Missing
Taught me about a number of careers of which I hadn't been aware	5	51	42	2
Showed me that women can successfully combine careers and family lives	8	43	47	2
Taught me about the preparation needed for various science careers	8	48	42	3
Showed me the importance of keeping my options open by taking science and mathematics courses in high school	7	38	53	2
Encouraged me to seek further information about science career opportunities	9	41	48	2

n = 10,790

D. Interest in Future Participation in the Visiting Women Scientists Program

Only one woman scientist who returned a Record of Visit (Appendix E) answered "no" when asked if she would be interested in participating in the Visiting Women Scientists Program in the future. In addition, contact persons were asked whether they would be willing to act as a contact person again if their schools decided to participate in the future (Appendix C). Contact persons in 96 percent of the schools responded "yes," while those in four percent said "no." While the role of the contact person often required a considerable expenditure of time and energy (as discussed in Chapter V), most of the contact persons appear to have accepted the role well.

Approximately a month after the visit, the contact persons received the Follow-Up Questionnaire. The purpose of this form was to evaluate the impact of the program; and the contact persons were asked to consult their colleagues as necessary in order to answer the questions. When asked if the Visiting Women Scientists Program was of value to their students, contact persons in 107 out of 108 responding schools said "yes." Contact persons were also asked if their schools would like to participate in the future if the program were to be continued. Ninety-eight percent of schools who returned forms indicated that they would like to participate again.

E. Comparison of the 1978 Pilot Program and the 1978-79 Program

The 1978 pilot and the 1978-79 Visiting Women Scientists Program were very similar in design. The 1978-79 program was conducted in somewhat larger schools in more urban areas, and some modifications were made to the program based upon recommendations from the pilot experience, mostly in program materials and training the visitors for more structured presentations. As might be expected, descriptive evaluation results were very similar in the two years. The Visiting Women Scientists Program was well accepted by all participants with only minor differences in results from one year to the next.

Contact persons were asked if their schools would like to participate it the program were offered again; at least 90 percent of those who responded in both years answered "yes." When asked if they would be willing to act as contact person again if their school participated, 95 percent of those who responded answered favorably in both programs. Also, women scientists responded very positively to their role in both years. All of the women sci-

entists who participated in the pilot program indicated interest in participating again, and all but one of those who returned a form in the 1978-79 program expressed interest in participating again.

The field representatives were also rated quite highly as a group in both years. During the 1978 pilot program, 35 of the 40 women scientists rated their field representative as "excellent" in a composite rating, with the other five rating her "good." In the 1978-79 program, ratings were made by categories; field representatives were rated "excellent" or "good" in every category by at least 98 percent of the women scientists who returned forms.

Similar ratings were made by school contact persons. In the 1978 pilot program, 97 percent of them rated the field representatives "excellent' or "good" in the composite rating, and in 1978-79 at least 96 percent rated the field representatives "excellent" or "good" in each category. Finally, field representatives were rated somewhat more highly by students in 1978-79. During the pilot program the percent of students rating each field representative excellent ranged from 21 to 40 percent, while the range was 31 to 50 percent during the 1978-79 program.

The 1978-79 Visiting Women Scientists Program was rated excellent more often by students than in the 1978 pilot program (37 percent compared to 29 percent), and the percent of students rating the program either excellent or good was also larger for the 1978-79 program (91 percent compared to 84 percent). In both years more females than males considered the program excellent; those percents also improved for the 1978-79 program (37 percent of females and 32 percent of males compared to 31 and 21 percent for the pilot program.)[11]

The class meetings with both males and females were not conducted during the 1978-79 Visiting Women Scientists Program, but seminars were rated about the same in each year of the program. The new follow-up meetings for the 1978-79 program were rated very well, better than either classes or seminars in the pilot program.

Comparing responses for the two years of the program, students indicated that several specific aspects of the program were more valuable in the 1978-79 program than in the pilot program. Responses in 1978-79 ranged from 53 percent considering the program to be very valuable in communicating the importance of keeping one's options open to 42 percent indicating that it was very

valuable in teaching them about a number of careers. Comparable percents for those two questions in the pilot program were 47 and 34 percent. The largest difference in percents occurred in the question about showing the students that women can successfully combine careers and family lives; in 1978-79, 47 percent considered that a very valuable part of the program compared to only 32 percent of students in the pilot program.

Overall comparative ratings showed a small increase from the pilot program to the 1978-79 program. This probably can be attributed to modifications made from recommendations of participants in the pilot effort. Most of these modifications involved one of the following: revised program materials; more highly structured presentations using ideas to which the students were most responsive; and improved training and orientation of field representatives and women scientists.

F. Pilot Program Follow-Up

During the 1978-79 program, schools which were part of the 1978 pilot Visiting Women Scientists Program received follow-up questionnaires to obtain some data relating to the program's impact approximately one year after the visit. The questionnaires (included in Appendix H) ask about: females seeking information about careers; use of the Occupational Outlook Handbook; any increase in the number of females taking elective mathematics and science courses; use of the resource packet; and interest in future participation.

This section presents results from school staff in experimental schools which were visited and control schools, which received the resource packets but were not visited during the 1978 pilot program. Questionnaires were received from 59 of 75 experimental schools for a response rate of 79 percent, and from 25 of 40 control schools for a response rate of 63 percent.

None of the differences in results between experimental and control schools were statistically significant at the .05 level of confidence. Because the results are based on very small samples, the sampling errors associated with statistical estimates are quite large and only very large differences between groups would be statistically significant. In the paragraphs below the control group results are presented in parentheses with the appropriate results from experimental schools.

When asked about the number of females seeking information about science careers from guidance counselors since the visit, 49 percent of the experimental schools responded there were more than the usual number for a similar period of time, while another 49 percent said it was about the same (32 percent and 60 percent respectively in control schools). In those schools having a copy of the Occupational Outlook Handbook 34 percent of respondents said more than the usual number of female students used it; in 64 percent usage was "about the same" (29 and 71 percent respectively in control schools).

Respondents were also asked about the number of female students enrolling in elective mathematics courses since the program. Thirty-four percent responded "more than the usual number;" 63 percent responded "about the usual number;" and 3 percent did not respond (16 percent "more" and 84 percent "about the usual" for control schools). In response to the same question about elective science courses, 34 percent said that more than the usual number were enrolling and 64 percent said it was about the same (36 and 64 percent in control schools).

When asked if the resource packets had been used, 78 percent said they had been, and 3 percent said they had not, with 19 percent saying they did not know (72, 8, and 20 percent in control schools). In terms of use by particular types of school people, results in experimental schools were similar to those found during both the pilot and 1978-79 programs: students used the resource packets in 64 percent of the schools; counselors and teachers each used them in over 45 percent of the schools; and librarians, administrators and others used them much less frequently. Fourteen percent of respondents said that some films or other materials listed in the List of Resource Materials had been ordered; while 51 percent said none had been ordered, 32 percent said they did not know, and 3 percent did not respond (16, 56, 28, and 0 percent respectively in control schools).

Finally, respondents in experimental schools were asked whether their schools would like to participate in the Visiting Women Scientists Program if it again became available in their area. Eighty-eight percent said they would; six percent said they would not; and six percent did not respond.

FOOTNOTES

[1] "The Development of a Visiting Women Scientists Program for Secondary Schools: Phase I Final Report." National Science Foundation, Washington, D.C., October 1977.

[2] "The Visiting Women Scientists Pilot Program, 1978, Final Report" Iris R. Weiss, Carol Place, and Larry E. Conaway, National Science Foundation, Washington, D.C., August 1978. The pilot report is available from the National Technical Information Service (NTIS), U.S. Department of Commerce, Springfield, Virginia 22161. The access number for the full technical report is PB286372/AS ($9.00), and the Highlights Report is PB286373/AS ($4.00). The pilot report has also been submitted to the Educational Resources Information Center (ERIC).

[3] These materials are not copyrighted and may be reproduced as needed. It is requested that the source be acknowledged as follows: "Prepared by the Center for Educational Research and Evaluation, Research Triangle Institute, as part of the National Science Foundation-supported Visiting Women Scientists Program."

[4] This booklet had been mailed to students in the pilot program who returned a postcard requesting additional information. Since postcards were not used in the 1978-79 program, the remaining copies of the booklet were sent to the schools for distribution to interested students. It is published by American College Testing Publications, Iowa City, Iowa.

[5] I'm Madly in Love with Electricity, Lawrence Hall of Science, University of California, Berkeley, California.

[6] Occupational Outlook Handbook, 1978-79 U.S. Department of Labor, Bureau of Labor Statistics, Washington, DC.

[7] I Can Be Anything--Careers and Colleges for Young Women 1978 (Mitchell) College Entrance Examination Board, Princeton, New Jersey.

[8] The forms from three schools in Pennsylvania were lost in the mail and were therefore not included.

[9] Three field representatives were employed in California, Minnesota, and Pennsylvania and an RTI staff member, who had been a field representative during the pilot program, was the field representative in North Carolina.

[10] Although the plan for 1978-79 was to have only females at meetings, a few schools included some males.

[11] Nonrespondents are included in total students when calculating these percents.

APPENDIX A

Letter to Chief State School Officers
Superintendent Letter and Form
Press Release

RESEARCH TRIANGLE INSTITUTE
POST OFFICE BOX 12194
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

CENTER FOR EDUCATIONAL RESEARCH AND EVALUATION

September 26, 1978

Secretary of Education
Pennsylvania Department of Education
Harrisburg, PA 17216

Dear :

Last year a number of Pennsylvania schools participated in the National Science Foundation's pilot Visiting Women Scientists Program which was conducted by the Research Triangle Institute (RTI). The pilot program was quite successful, and as a result NSF has contracted with RTI to conduct the program during the 1978-79 school year. I am enclosing a brochure which describes the plans for this program. We have discussed the purposes and procedures of the program with the CEIS Data Acquisition Subcommittee; a copy of the Subcommittee's Document of Detail Study and Recommendation is attached.

For reasons of cost-effectiveness, we would like to schedule a total of 45 visits in the Philadelphia area for the period January-May, 1979. Our plan would be to first arrange visits to interested Philadelphia schools and then fill in the schedule with other schools within a 100-mile radius of Philadelphia. If you have any questions or concerns please call me (collect 919-541-6317).

Sincerely,

Iris R Weiss

Dr. Iris R. Weiss
Visiting Women Scientist Program

IRW:cr
Enclosures

(919) 541-6000 FROM RALEIGH, DURHAM AND CHAPEL HILL

RESEARCH TRIANGLE INSTITUTE
POST OFFICE BOX 12194
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

RTI

CENTER FOR EDUCATIONAL RESEARCH AND EVALUATION

March 8, 1979

Dear Superintendent:

The National Science Foundation is supporting a Visiting Women Scientists Program to be conducted by the Research Triangle Institute. The program is designed to encourage high school females to consider careers in science, including biological science, physical science, engineering, mathematics and social science. Visits will be conducted in approximately 45 Philadelphia area schools January-May, 1979; 45 schools in each of two other areas of the United States will also be visited. A brochure describing the program has been enclosed along with the letter which would be sent to principals.

We would like to offer the opportunity to participate in this program to high schools in your district. The purpose of this letter is to obtain your permission to contact the schools. If you have no objections to our contacting high schools in your district, would you please fill out the enclosed form and return it to RTI in the postage-paid envelope provided as soon as possible.

Thank you for your assistance and cooperation. Feel free to call me collect (919-541-6318) if you have any questions.

Sincerely,

Carol Place

Carol Place
Project Director
Visiting Women Scientists Program

CP:cr
Enclosures

(919) 541-6000 FROM RALEIGH, DURHAM AND CHAPEL HILL

VISITING WOMEN SCIENTISTS PROGRAM

SUPERINTENDENT FORM

District: _____

You have my permission to contact schools in our district to determine their interest in participating in the Visiting Women Scientists Program.

Signed by: _____

Title: _____

Date: _____

If there are particular schools you would like us to contact please complete the following:

1. School: _____ Grade Range: _____
   Address: _____
   _____
   Principal: _____ Phone #: _____

2. School: _____ Grade Range: _____
   Address: _____
   _____
   Principal: _____ Phone #: _____

3. School _____ Grade Range: _____
   Address: _____
   _____
   Principal: _____ Phone #: _____

VISITING WOMEN SCIENTISTS PROGRAM
SUPPORTED BY THE NATIONAL SCIENCE FOUNDATION

From January through May of 1979, women scientists will visit with female students in approximately 145 junior and senior high schools in the United States for the National Science Foundation-supported Visiting Women Scientists Program.

The Visiting Women Scientists Program is an attempt to increase the participation of females in careers in mathematics, engineering, physical, biological and social science. In addition to giving female students an opportunity to meet and interact with woman scientist role models, the program provides information about career opportunities and presents examples of women scientists who successfully combine their science career and personal life.

A pilot Visiting Women Scientists Program, also supported by the National Science Foundation, was conducted in 1978 by the Center for Educational Research and Evaluation of the Research Triangle Institute (RTI) in North Carolina. The visits to 110 United States high schools in the pilot program were very well received by students and staff, and evaluation results indicate that they were successful in encouraging female students to seek further information about science careers.

In 1979, about 45 schools will be visited in each of three major metropolitan areas: Los Angeles, Minneapolis-St. Paul, and Philadelphia. Typically, an RTI representative and a woman scientist from the local area will spend one day at a school. In addition to making presentations to groups of ninth and tenth grade female students, the visitors will conduct seminars for eleventh and twelfth grade females who already have an interest in science. They will also meet with teachers, counselors and administrators to encourage them to provide support to women who are considering science careers.

For more information, please contact:

Ms. Carol Place, Project Director
Visiting Women Scientists Program
Research Triangle Institute
P. O. Box 12194
Research Triangle Park, N. C. 27709

APPENDIX B

Principal Letter and Form

RESEARCH TRIANGLE INSTITUTE
POST OFFICE BOX 12194
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

CENTER FOR EDUCATIONAL RESEARCH AND EVALUATION

Dear Principal:

The National Science Foundation (NSF) is supporting a Visiting Women Scientists Program to encourage high school girls to consider pursuing careers in science (including social science, mathematics, and engineering as well as biological and physical science). The program will be conducted by the Research Triangle Institute (RTI) during January through May, 1979 in Philadelphia and in two other areas of the United States. The purpose of this letter is to determine if your school wishes to participate in this program.

The enclosed brochure describes the Visiting Women Scientists Program in some detail. Visits will include (1) at least one large group meeting of 9th and/or 10th grade females, (2) one or more follow-up seminars for interested females who attended the large group meeting, and (3) one or more seminars for 11th and 12th grade females who are particularly interested in science, mathematics or social science. We would also like to schedule a meeting with interested staff members to discuss the program and methods for assisting students to learn more about science career opportunities. In addition, participating schools will receive two Resource Packets of science career materials.

If you are interested in having your school participate in the Visiting Women Scientists Program, please return the enclosed form to RTI in the postage-paid envelope that has been provided as soon as possible. We will work with the "contact person" you designate in scheduling, planning, and conducting a visit which will be valuable to the participants without causing undue disruption to the normal operations of your school. Brief questionnaires will be given to some of the participants to evaluate the program.

We feel that the Visiting Women Scientists Program will be a valuable contribution to your ongoing career education activities and look forward to the opportunity to provide this service to your school.

Sincerely,

Ms. Carol Place
Project Director
Visiting Women Scientists Program

CP:cr
Enclosures

(919) 541-6000 FROM RALEIGH, DURHAM AND CHAPEL HILL

VISITING WOMEN SCIENTISTS PROGRAM

PRINCIPAL FORM

1. The daylong visit will be scheduled between mid-January and early May, 1979. We will attempt to schedule the visit at a convenient time for you.

   a. Are there periods of time (e.g., weeks or months) when you would prefer the visit be scheduled? If so, please indicate.

   _____

   b. Are there specific dates during which school will not be in session or a visit would be impossible? If so, please indicate.

   _____

2. Please provide the name, title, and phone number of the person that we should contact to discuss details of the program. This person should be available to assist in scheduling the visit. It would also be helpful if he/she could accompany the women scientists during the day of the visit. We will contact this person within the next few weeks.

   Contact Person's Name: _____
   (Include Ms., Mr., Dr., etc.)

   Title or Staff Position: _____

   Phone Number: Area Code ( ) _____

   School Name: _____

   School Mailing Address: _____

   _____

   Principal's Name: _____

THANK YOU FOR YOUR COOPERATION.

PLEASE RETURN THIS FORM AS SOON AS POSSIBLE TO RTI IN THE ENCLOSED POSTAGE-PAID ENVELOPE.

APPENDIX C

School Contact Person Letter

Record of Visit

Follow-up Questionnaire

School Information Form

RESEARCH TRIANGLE INSTITUTE
POST OFFICE BOX 12194
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

February 12, 1979

[Contact Person's
Name and Address]

Dear [Contact Person]:

Your school will be participating in the National Science Foundation's Visiting Women Scientists Program to be conducted by the Research Triangle Institute (RTI) of North Carolina. An RTI Field Representative and a woman scientist from your area will visit your school for the entire day on [day and date of visit], and meet with female students and staff members. The purpose of the program is to encourage female students to consider careers in science, including biological science, physical science, mathematics, social science, and engineering.

Your principal has designated you as the person to contact in making the arrangements for the visit. Typically a visit will include 4 or 5 meetings with students and a brief meeting with some staff members. Each visit must include at least one seminar of no more than 30 interested 11th and 12th grade females and one large group meeting of 9th and/or 10th grade females. These meetings are described below and our Field Representative will work with you in planning a visitation schedule that is appropriate for your school.

1. One or more seminars, each consisting of 20-30 11th and 12th grade female students. Teachers could designate students with particular interest or ability in science and mathematics or students could be provided the opportunity to decide to attend a seminar.

2. A large-group meeting of up to 150 9th and/or 10th grade female students. If your school has more than 150 of these students or if there is no room to accommodate this many at once, multiple large group meetings can be conducted. Since slides will be shown at the large-group meetings (and possibly at other meetings as well), it will be necessary for you to provide a slide projector.

3. One or more meetings with small groups of 9th and/or 10th grade females who attended the large group meeting (no more than 40 per meeting). These students should be selected based on their interest or ability in science or mathematics.

4. A brief meeting with guidance and/or career counselors, the school librarian, and as many science, mathematics, and social science teachers as possible. (If other district or school personnel are interested they are also welcome to attend.)

(919) 541-6000 FROM RALEIGH, DURHAM AND CHAPEL HILL

The purpose of the meeting will be to discuss ways to assist female students in obtaining information about science career opportunities. As part of this, you might like to have a librarian, counselor, or other knowledgeable person talk briefly about the relevant resources (such as the Occupational Outlook Handbook) already available in the school. The visitors will then describe the science career materials in the Resource Packets which are being given to the school.

You will note that male students are not included in any of the program activities. In the pilot program conducted last year we included males in some sessions to see if we could promote the attitude among both males and females that science and technology careers are appropriate for women as well as men. Because of their overall greater interest in science, male students often dominated discussions about science careers and thus may have reinforced the notion that science is a male's domain. In addition, female students almost never raised questions concerning the problems associated with combining personal lives and successful careers when males were present. For these reasons, it was decided not to include males in the 1978-79 program.

Please complete the enclosed green School Information Form and return it to RTI as soon as possible in the postage-paid envelope that has been provided. The form requests certain information we need to plan the visit. Questions 2a and 2b refer to a faculty and staff memorandum which RTI will prepare and ask you to distribute; a draft of the memorandum is enclosed. We would like you to indicate the number of copies of this memorandum you will need. Some schools will wish to distribute these to all faculty and staff, while others will wish to distribute them to a limited number of faculty and staff who will have students involved in the program or who have a particular interest in the program's purposes.

When we receive your completed form, we will send you the requested number of memoranda, as well as several announcements of the program for you to post. We will also send you two Resource Packets containing science career materials. [Field Representative's name], the RTI Field Representative who will accompany the woman scientist during the visit, will call you shortly to work out the details of the visit.

We appreciate your assistance and look forward to working with you in this program. If you have any questions, please feel free to call me collect at (919) 541-6318.

Sincerely,

Carol Place, Project Director
Visiting Women Scientists Program

CP:cr
Enclosures

RESEARCH TRIANGLE INSTITUTE
POST OFFICE BOX 12194
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

MEMORANDUM DATE: [ ]

TO: Faculty and Staff
[School Name]

FROM: Carol Place
Project Director, Visiting Women Scientists Program

On [day and date of visit], visitors from the Visiting Women Scientists Program will be in your school to meet with female students in grades 9-12. This program is sponsored by the National Science Foundation.

The major purpose of the Visiting Women Scientists Program is to encourage the participation of women in careers in science and technology (including biological science, physical science, mathematics, social science and engineering) through interaction with woman scientist role models. Participating students will be provided with information about career opportunities in science and technology and about the preparation needed for such careers.

Two packets of science career resource materials are being given to your school. In addition, we recommend that all schools make available to their students copies of The Occupational Outlook Handbook and I Can Be Anything--Careers and Colleges for Young Women.

For the visit in your school, the woman scientist will be [woman scientist's name, occupation, employer]. [Field Rep's name], the RTI Field Representative who will accompany [woman scientist], is a [Field Rep's background experience].

The program at [name of school] is being coordinated by [contact person's name and title]. [Contact person] is working with [Field Rep] to establish a schedule of activities for the daylong visit.

We are looking forward to the visit in your school and hope it will be a worthwhile activity for your students.

CP:cr
Enclosures

(919) 541-6000 FROM RALEIGH, DURHAM AND CHAPEL HILL

ID# _____

O.M.B. No. 99-R0310
Approval Expires 5/31/82

VISITING WOMEN SCIENTISTS PROGRAM
SCHOOL CONTACT PERSON RECORD OF VISIT

Name _____ Title _____

School _____ Date of Visit _____

1. Approximately how much time did you spend in arranging for the visit? (Including time spent arranging the schedule, talking to teachers, corresponding with the visitors, etc.)

(Circle one.)

Less than 2 hours	1
2-5 hours	2
6-10 hours	3
More than 10 hours	4

2. It is important to the success of this program that the Field Representative (the visitor who worked with you in setting up the details of the program) be pleasant and courteous and do everything possible to ensure that the visit runs smoothly without inconveniencing the school. Please rate the Field Representative's performance in the following regards, and add any other comments which you think will help us.

(Circle one on each line.)

	Excellent	Good	Fair	Poor
a) Working with you in scheduling the visit	1	2	3	4
b) Interaction with students	1	2	3	4
c) Knowledge of various careers	1	2	3	4
d) Enthusiasm about the program	1	2	3	4

Comments:

(OVER)

3a. Were there any problems encountered in planning for and/or conducting the visit? (Problems might include scheduling difficulties, equipment failure, visitors could not be heard in the back of the room, etc.)

(Circle one.)

Yes . . . . . 1 *Go to Q3b.*
No . . . . . 2 *Go to Q4.*

3b. If so, please describe the problem(s) and suggest how they were solved.

4. Would you be willing to act as contact person if your school decided to participate in this program at some future time?

(Circle one.)

Yes 1
No 2

If no, please give your reason(s).

Other Comments

Please send this form to RTI in the postage-paid envelope provided as soon as possible. Thank you for your cooperation.

ID# _____

O.M.B. No. 99-R0310
Approval Expires 5/31/82

1978-79 VISITING WOMEN SCIENTISTS PROGRAM
FOLLOW-UP QUESTIONNAIRE

Name _____ School _____

Title _____

Several weeks ago your school participated in the Visiting Women Scientists Program. We would like to enlist your aid in evaluating the impact of this program; you may need to consult with several of your colleagues in order to answer these questions.

1. Was the Visiting Women Scientists Program of value to your students?

(Circle one.)

Yes 1
No 2

2. The number of female students seeking information about science careers from guidance counselors since the program has been:

(Circle one.)

More than the usual number for a similar period of time 1
About the usual number for a similar period of time... 2
Less than the usual number for a similar period of time 3

3a. Have the resource packets which were given to the school been used?

(Circle one.)

Yes ..... 1 *Go to Q3b.*
No ..... 2 *Go to Q4.*
Don't Know .... 3 *Go to Q4.*

3b. By whom?

(Circle all that apply.)

a) Students 1
b) Teachers 2
c) Counselors 3
d) Librarians 4
e) Administrators 5
f) Others 6

(OVER)

4. Have any films or other materials listed in the resource packet or annotated bibliography been ordered?

(Circle one.)

Yes 1
No 2
Don't know. 3

5. Are there plans to order any materials listed in the guide to the resource packet in the future?

(Circle one.)

Yes 1
No 2
Don't Know 3

6. If there is any other evidence of the impact of the Visiting Women Scientists Program on students, teachers, counselors, and/or administrators, please describe.

7. If the Visiting Women Scientists Program becomes an on-going program, would your school like to participate in the future?

(Circle one.)

Yes 1
No 2

Please send this to RTI in the postage-paid envelope provided as soon as possible. Thank you for your cooperation.

O.M.B. No. 99-R0310
Approval Expires 5/31/82

V SITING WOMEN SCIENTISTS PROGRAM
SCHOOL INFORMATION FORM

1. School Name: _____ State: _____

2a. How many copies of the faculty and staff memorandum should be sent to you for distribution? _____

2b. You will be mentioned in the memorandum as the school's coordinator for the program. Please indicate the exact name and title you would like us to use.

_____

3. If there is a problem with conducting the visit in your school on the scheduled date please check here ☐ and we will contact you about rescheduling.

4a. What grades are included in your school? _____

4b. How many students are there in your school? _____

4c. What is the enrollment in each of the grades 9-12?

9	10	11	12

5. Which of the following best describes the location of your school?

(Circle only one.)

A rural or farming community	1
A small city or town of fewer than 50,000 that is not a suburb of a larger place	2
A medium-sized city (50,000-100,000 people)	3
A suburb of a medium-sized city	4
A large city (100,000-500,000 people)	5
A suburb of a large city	6
A very large city (over 500,000 people)	7
A suburb of a very large city	8

6. Approximately what percent of the students in your school are in each of the following categories?

a.	_____	American Indian or Alaskan Native
b.	_____	Asian or Pacific Islander
c.	_____	Black, Not of Hispanic Origin
d.	_____	Hispanic
e.	_____	White, Not of Hispanic Origin
	100%	

Answer question 7 only if your school includes the twelfth grade.

7. What percent of your graduating seniors go on to:

4-year college	_____ %
2-year college or technical school	_____ %
Total	_____ %

APPENDIX D

Field Representative Introductory Letters

Field Representative Training Materials

- Outline of Introductory Remarks
- Descriptions and Guidelines for Meetings and Learning Activities (See Learning Activities in Appendix F)
- Field Representative Study Guides for Women in Science Careers
- Summary of Field Representative Responsibilities

Field Representative Meeting Activity Record

Field Representative Visit Record

Field Representative Evaluation Form

Student Form

RESEARCH TRIANGLE INSTITUTE
POST OFFICE BOX 12194
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

December 15, 1978

Dear

We are delighted that you have agreed to serve as a Field Representative for the NSF-sponsored Visiting Women Scientists Program. As we mentioned, there will be a one-week training session at RTI Monday, January 8 through 3:00 p.m. Friday, January 12; please plan to arrive the evening of the 7th. We have made reservations for you at the Governor's Inn in Research Triangle Park for the nights of January 7-11; a limousine to the Inn is available from the Raleigh-Durham Airport. Let's plan to meet in the lobby of the motel at 9:00 a.m. on Monday for breakfast.

You will need to make your own travel arrangements. We will soon send your travel advance to pay for your round trip airfare and your expenses while here. Be sure to save your hotel receipt and a copy of your plane ticket. Keep track of the amounts you spend each day for meals, limousine, tips, etc.; you will not need receipts for these items. We will go into detail at the training session about receipts you will need and how to document expenses.

Your period of employment begins on January 2. You will have four working days prior to the training session to read a number of materials related to the Visiting Women Scientists Program. Enclosed are some of the materials; additional materials will be mailed soon.

Please read the enclosed 15-page Highlights Report of the pilot program first. It will give you a good overview of the way the 1977-78 program operated. The full Technical Report is enclosed for your reference; you may be particularly interested in reading the recommendations chapter as we have incorporated many of these ideas into the plans for the 1978-79 program.

It is extremely important that you become well informed about a variety of science careers in order to answer student questions. We also want you to be familiar with a number of sources that students, teachers, and counselors can use to obtain additional information about science careers. Thus, the following are enclosed:

1. Reprints from the Occupational Outlook Handbook (in the black notebook). This "encyclopedia of careers" includes information on more than 800 occupations. We have included only those which relate to science and technology careers (note that NSF defines science to include biological science, physical science, engineering, mathematics, and social science). Feel free to underline or

(919) 541-6000 FROM RALEIGH, DURHAM AND CHAPEL HILL

highlight these reprints if that will help you remember important points. We have also ordered a copy of the entire Handbook for you to take with you to the schools; this is one of the major sources we will be recommending that schools make available to students.

a. Engineering and Related Occupations

Concentrate on pages 1-17 about engineering careers; this field will be stressed repeatedly in the Visiting Women Scientists Program. Also read about engineering and science technicians (pp. 17-22). While NSF is focusing on careers which require at least a 4-year degree, you will need to be prepared to answer student questions on technician careers. This is especially true in schools where relatively few students go on to 4-year colleges or universities.

b. Physical and Life Scientists

Read the entire reprint. (Please note that NSF does not include medical fields in their definition of science.)

c. Environmental Scientists

Read the entire reprint.

d. Mathematics and Related Occupations

Skip over "accountants" and "actuaries" but read the sections on Mathematicians, Programmers, Statisticians and Systems Analysts (pp. 6-14).

e. Lawyers, City Managers, and Social Science Occupations

Skip the sections on lawyers and city managers, but read the sections on social scientists (pp 7-15 and 17-24; note that NSF does not classify history as a social science).

f. Education and Related Occupations

Read the section on college and university teachers (pp. 7-9); a major message of this program is that the employment outlook for scientists is much better in industry than in academia. You may also want to skim the sections on elementary teachers, secondary teachers and librarians. While we will not make negative statements about these or any other traditionally female careers, we will point out that both the employment outlook and salaries are more favorable in "non-traditional" occupations.

2. Excerpts from Science Career Briefs (also in the black notebook). These short descriptions of careers provide some additional information which is not included in the Occupational Outlook Handbook and they will help you familiarize yourself with a number of career opportunities.

3. I Can Be Anything - This book was written specifically for high school girls and includes a description of various careers as well as a consideration of lifestyle. Please read the introductory sections and the sections on specific science careers.

College catalogues are a useful source of information about the training required for particular careers. Please obtain a recent catalogue from at least one major college or university near you (UCLA for Los Angeles, University of Minnesota for Minneapolis, and Temple for Philadelphia come to mind); then skim the science-related sections to get an idea of the entrance and graduation requirements for various majors. Be sure to include engineering since this is such a promising field for women yet few high school girls know anything about it.

The black notebook also contains a section on "communications with schools." Each principal received a letter of invitation and was asked to give information about date preferences and the name of a contact person. The contact person then receives a letter which gives details about the visit, including the date, and a form to use in providing information about the school (e.g., size of school and racial distribution). Once the school information form is returned to RTI, the contact person is sent copies of materials to distribute to faculty members; these materials describe the purposes and procedures of the visit and give the name of the woman scientist and the field representative.

We will shortly send you a copy of the Resource Packet which is being left at the schools, detailed information about the various types of presentations you and the women scientists will be giving, copies of the forms which will be used in documenting and evaluating the visits, and other related materials for review and use at the training session.

Please do not hesitate to call me (collect 919-541-6318) if you have any questions or concerns.

All of us at RTI who are involved with the Visiting Women Scientists Program are looking forward to meeting with you at the training session.

Sincerely,

Carol Place

Carol Place
Project Director
Visiting Women Scientists Program

CP:cr
Enclosures

RESEARCH TRIANGLE INSTITUTE
POST OFFICE BOX 12194
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

December 22, 1978

Dear

Here are the additional materials for you to use prior to the training session. Please add the hole-punched pages to your black notebook. The slides are for your presentation on women in science careers (see the "Activities" section of the black notebook).

The brown folder is the Visiting Women Scientists Program Resource Packet. Each school will receive 2 of these and can request additional copies (usually limited to 2 more). Typically a school will keep one Packet in the counselor's office and one in the library or science department. As part of your presentations you will be encouraging students to refer to these materials. You will also describe the contents of the Resource Packet during the staff meeting. Specifically you will be mentioning the ACT booklet "Women in Science and Technology" (it is included in the Resource Packet and each contact person will also receive approximately 50 copies for distribution to students) and the booklet "I'm Madly in Love with Electricity." You should also pick out 5 or 6 additional publications and be prepared to say a sentence or two about each so that staff members will get a better idea of the potential utility of the Packet.

Also read over the annotated bibliography section of the List of Resource Materials. You will be stressing the first 3 entries as materials all schools should consider ordering, and will also mention a number of the films. You will get a chance to see the films at the training session and will also receive copies of New Career Options for Women and the complete Occupational Outlook Handbook.

Please read the activities section of the black notebook. We will spend a good deal of time at the training session discussing the various presentations you will be giving. You will be able to observe the presentations in a visit to be conducted by Mary Ellen Taylor (one of last year's field representatives and now an RTI employee) and a woman scientist; you will also get a chance to conduct some of the presentations yourself in another visit.

The outline of the field representative introduction lists the points you will be making in each large group meeting (9th and/or 10th grade girls) and seminar (11th and/or 12th grade girls). The narrative introduction is the way Mary Ellen presents these points. You are free to use your own words as long as you get the points across and

(919) 541-6000 FROM RALEIGH, DURHAM AND CHAPEL HILL

spend no more than 15 minutes for the introduction and slide presentation combined. The slides are keyed to the outline of the slide presentation; asterisks indicate scientists who participated in last year's program. You should practice the introduction and slide presentation since you will be trying it out in a seminar during the training session.

The Case Study, Matching Exercise, and "Thinking About a Career" handouts are modular activities. You will find them most useful in the followup meetings (where particularly interested 9th and 10th grade girls who attended the large group meeting return for a small group meeting). Again you will get an opportunity to observe, and perhaps try, each of these activities during the training session.

The Outline of the Staff Meeting is self-explanatory; we hope to be able to have you observe a staff meeting during the training session. Also, please read the woman scientists "training" letter carefully. You will have an opportunity to see how 2 different women scientists interpreted our suggestions. In addition, Mary Ellen will also give you some suggestions for helping women scientists plan effective presentations.

You need not concern yourself with the section on documentation and evaluation at this point, although you may want to skim through the forms; the use of each of these forms will be covered at the training session.

Your remaining tasks relate to information about science careers. Your resources for these tasks are I Can Be Anything, catalogues from colleges in your area, the classified sections of your local newspapers, the tables included in the "Statistics on Science Careers" section of your black notebook, the Occupational Outlook Handbook reprints and the Science Career Briefs. The tasks you need to complete are described in the "Study Guide" section of the notebook.

Please bring the black notebook, college catalogue(s), classified ads, slides, and your completed written work to the training session. Also keep a list of any questions you have as you read these materials so we can be sure to answer them at the training session.

We realize that we've given you quite a lot of material to deal with in a short period of time. Feel free to call if you have any questions (collect 919-541-6318).

If you have not already done so, you need to make plane reservations to Raleigh-Durham January 7 for the training session; your travel advance is enclosed.

Sincerely,

Carol Place

Carol Place, Project Director
Visiting Women Scientists Program

P.S. - The other 2 Field Representatives are Sandra Levine of Los Angeles and Gail Goldman of Philadelphia.

VISITING WOMEN SCIENTISTS PROGRAM

Outline of Field Representative Introductory Remarks

I. Definition of Project

A. Introduction of Speakers - Woman Scientist and Field Representative - Background and Occupation

B. VWSP Purpose: A National Science Foundation Project to Encourage Young Women to Consider Careers in Science

C. Fields of Science Included in Visiting Women Scientists Program

1) Engineering: More than 25 specialties with 85 subdivisions
2) Life Sciences: Biology, Zoology, Anatomy, Biochemists, Agronomy, Botany
3) Physical Sciences: Chemistry, Physics, Astronomy
4) Social Sciences: Psychology, Sociology, Anthropology, Economics, Political Science
5) Mathematics: Statistician, Mathematician, Computer-related occupations

II. Career Information

A. Women in Labor Force

1) 90% of all women work at some time in their lives; 60% work 30 years or more
2) Many of these women in the labor force are working out of necessity - supporting themselves and their families. Today's economy requires two incomes for many families. 4 out of 10 women become heads of households due to divorce or death of husbands
3) Chances are females will work: Don't get locked into low-paying unskilled job by failing to realize that posibility
4) Begin to plan for career and take steps necessary to enter a range of careers

B. Opportunities in Science

1) Breaking down myths

a) You Can Be Anything - All areas open to women today - pioneering has taken place - women have proven their abilities in science & technology careers

b) Affirmative action and equal opportunity programs expanding opportunties for women

c) You don't have to be a genius to have a career in Science

2) Favorable job opportunities

   a) Private industry...Eastman Kodak, Proctor and Gamble, IBM
   b) Engineering ... less than 2% of all engineers in work force are women, but colleges and universities have larger percent of women in engineering training. Most favorable opportunities in agricultural, ceramic, industrial, mining and petroleum engineering.

3) Emerging careers: With prerequisites one can move into new areas with ease as they open up. Two examples are:

   a) Environmental science
   b) Computer related careers

4) Combining areas of interest: Combining scientific or technical degree and other interests is one method of securing financially rewarding position while retaining interests

   a) Art and science
   b) Computer science and psychology
   c) English/writing ability and science

5) Solving society's problems: Women often express desire to "help others." In science, one can work toward solutions to societal problems, e.g., pollution

6) Challenge of science career

III. VISITING WOMEN SCIENTISTS PROGRAM SLIDE PRESENTATION: Slides of women in diverse nontraditional careers will be shown with comments about each.

IV. Seek Additional Information - The importance of intelligent, informed decision re: career. You don't know that you want to be a(n)_____ unless you know what they do, what training is involved, etc. To help you seek information, check these sources:

1) Resource Packet provided by the VWSP - location in school - contains ACT booklet, many career publications, information on financial aid
2) Occupational Outlook Handbook
3) I Can Be Anything
4) School personnel familiar with career publications; people in the field in which you are interested

V. Plan for A Career

A. Importance of Prerequisites

1) Students should take as many math and science courses as possible
2) Don't close off options at high school level by not taking math and science coursework - Don't have to be an "A" student to make it worthwhile
3) No science career is out of reach if you have prerequisites

LARGE GROUP MEETING

Description

In every school there will be at least one large group meeting of ninth and/or tenth grade females, and in many schools there may be two large group meetings. While we would like to include all ninth and tenth grade females in each participating school, we realize this may not be possible in very large schools without appropriate facilities for presentations to at least half of the target females.

The major purpose of the meetings is to make all of these students aware of the potential for women in science and engineering careers at a time when they can still easily redirect their high school programs to emphasize (or include) mathematics and science. The meeting consists of the following:

(1) distribution of a copy of the "Help Wanted" brochure to each participant;

(2) a structured introduction by the Field Representative, including slides and profiles of several women scientists in nontraditional careers;

(3) a presentation by a woman scientist;

(4) and concluding remarks by the Field Representative.

In many cases those who attend a large group meeting will have no other exposure to the Visiting Women Scientists Program; therefore, it is important that the information be presented as clearly as possible in a quiet atmosphere. Although there will occasionally be circumstances beyond the control of the Field Representative which prevent a fully successful large group experience, the degree of success is generally very dependent upon the preparatory work of the Field Representative. The crucial areas of preparation include: working with the school Contact Person in arranging for the large group meeting; preparing the woman scientist for making a presentation to a large group of younger females; making last minute adjustments to the facilities; and commanding the interest and respect of the audience, particularly in the early minutes of the presentation.

The "guidelines" for the large group session include many details that require careful attention and which may appear on the surface to be asking a lot from the Contact Person. However, we believe this attention to detail is essential because school staff judge our program by how well our sessions run. In our various small group sessions, informality and interaction with students and teachers are beneficial; however, in the large group sessions, even minor disruptions are frustrating to Field Representatives and women scientists, distracting to students, embarrassing to school staff, and reflect negatively upon the program. Generally, school staff, women scientists and students will appreciate and respect our sincere desire for a quiet atmosphere and our careful attention to the details which will insure this.

LARGE GROUP MEETING

Guidelines

I. Telephone Discussion with School Contact Person

A. Determine maximum size of audience for a successful large group experience in the school. Remember that the objective is to place a great number of ninth and/or tenth grade females in a conducive atmosphere rather than a small number in a perfectly quiet atmosphere.

Then schedule the large group sessions. If all the ninth and tenth grade females cannot be reached in one or two sessions in the school's large group facility, it will be necessary for the school to select the students to participate in the sessions. Under these conditions, consider the following: (1) try to schedule two large groups of the maximum appropriate size so the Visiting Women Scientists Program reaches many young females; (2) and when such choices must be made, the students most appropriate for the program's purposes are those of higher science aptitude and/or those who have shown some previous interest in science.

When possible, schedule large group meetings early in the morning. Students are generally more receptive to a large group atmosphere in the morning, and the Field Representative and woman scientist have more of the energy which is sometimes required for these more formal presentations.

It is desirable to have 50 minutes or more for a large group meeting. You can generally plan on the following: at least 5 minutes to distribute the "Help Wanted" brochures and get the students seated and quiet; 15-18 minutes for the Field Representative introduction; 20-25 minutes for the woman scientist; and 5 minutes for the Field Representative to make concluding remarks. For every aspect of the session there is usually pressure to take more time, rather than less time.

Try to get at least 50 to 55 minutes scheduled for large group meetings. It is very undesirable to have only 45 minutes, and it is nearly impossible to conduct a large group session with less than 45 minutes. If you have less than 50 minutes, make adjustments in your presentations and discuss the potential problem with the woman scientist. It is preferable to leave out some information and have an orderly session rather than to attempt to squeeze in every piece of information and have a hectic session. Also, the Field Representative should be sure the woman scientist is not caught in the middle of her presentation as the large group session ends.

B. Discuss the availability of a public address system and whether it is needed with the projected size of the audience. If it is questionable, it is better to have it made available and not use it versus needing it and not being able to get it at the last minute.

C. Discuss the possibility of having a few faculty or staff present during the presentation. While we have very seldom had major discipline problems in large group meetings, the presence of 2 or 3 staff members prevents the "buzzing" which can be very distractive in the large group setting. One problem is that it does not take much noise to cause distraction in an auditorium with poor acoustics, especially when the presenters do not have amplification equipment. However, you should be sensitive to the fact that we have helped create our own problem in this regard. We are asking to have only females present, and this means the males are in classes so that most teachers are not free. Some sources may be: teachers who have free periods; counselors; librarians; administrators. One advantage we have is that some staff members, especially some women, will have an interest in the program and be willing to give some of their free time. Also, many counselors will view this program as very worthwhile to career education.

D. Be sure a slide projector and screen will be available. Also, discuss at least briefly the capability for darkening the room and for positioning the screen and projector far enough apart for a large image. You may not be able to determine the conditions exactly, but the discussion will help you determine if there may be serious problems and a need to insure some time in the facility prior to the large group presentation.

II. At the School Prior to the Session

A. Prepare slide projector and screen:

1. Be sure light, focus, and advance are working.

2. Check darkness of room and how to work room lights.

3. Set up for as large and clear a picture as possible.

B. Check acoustics:

1. If amplification, try it out for clarity.

2. Have woman scientist (or staff member) stand near the back of the room to check if you can be heard; do the same for her.

III. During Session

A. As students come in, the Field Representative and woman scientist (and possibly school staff) should have students sit toward the front, leaving no large gaps.

B. Speak loudly and distinctly.

C. The Field Representative must limit her introductory presentation to 15 minutes, including the slides. (There may be time for additional remarks after the woman scientist's presentation.)

D. Keep in mind that the large group session is basically a presentation and not a discussion period. We must make our points clearly; and while we can be friendly and interesting, it is not possible to successfully turn large group sessions into informal discussion periods.

Do not attempt to create question and answer periods and do not entice the students with promises that they will have an opportunity to ask specific questions during the session. If there is to be a follow-up session, tell the group that questions will be answered in that session for those that attend. (This does not mean that you will never answer an individual question in a large group session; however, experience has shown that large group sessions are basically one-way presentations.)

SEMINAR

Description

In every school there will be at least one seminar of eleventh and/or twelfth grade females, and in many schools there may be two or three seminars. The seminars will generally include a maximum of 30 females, but they may include as few as ten.

It is the objective of the program to make the seminars available to eleventh and twelfth grade females who have already shown an interest in science and mathematics and who are particularly interested in exploring science career opportunities. Participants in seminars may be chosen by school staff based on demonstrated interest and ability in science and mathematics, or they may be self-selected, using procedures developed by the contact person.

The major purposes of the seminars are (1) to reinforce the notions that women can be interested and successful in science careers and that they can combine these careers with full private lives, and (2) to provide specific information in response to students' questions. The meeting consists of the following:

(1) distribution of a copy of the "Help Wanted" brochure to each participant;

(2) a brief version of the structured introduction by the Field Representative, including a shortened presentation of slides and profiles of several women scientists in nontraditional careers;

(3) a presentation by a woman scientist;

(4) a question-and-answer session;

(5) an opportunity for each participant to obtain a copy of "Thinking About A Career";

(6) and filling out of student forms.

In virtually every case, those who attend a seminar will have no other exposure to the Visiting Women Scientists Program. The success of the seminar is probably dependent upon an adequate balance of clearly presented material and an informal, personal atmosphere providing an opportunity for questions and answers. The crucial areas of preparation include: working with the school contact person in determining the size of the seminars and the selection process; preparing the woman scientist for making an appropriate, brief presentation; and limiting the Field Representative's remarks to insure an opportunity for some audience interaction.

SEMINAR

Guidelines

I. Telephone Discussion with School Contact Person

A. Determine the location for the seminars. Experience has shown that the large group meeting room is not usually the best location for the seminars. This is especially true when the large group meeting room is built to accommodate over 100 people. These facilities often have poor acoustics for small groups, poor lighting, and a feeling of "emptiness".

If it is possible to conveniently obtain a regular classroom, this should be done; however, do remember that it is possible to overcome most operational circumstances and conduct a reasonably successful seminar with good presentations and vitality. In attempting to obtain optimal facilities for seminars (as for follow-up meetings), keep the following in mind:

(1) slides will be shown; therefore, the room needs to be darkened

(2) if the woman scientist has a demonstration, a table or desk should be available

(3) if at all possible, a single room should be available for the various seminars and follow-ups to prevent moving slide projectors, screens, and other materials around the school.

B. Determine how many seminars there will be, approximately how many students will attend each, and how the contact person might select the students. This will be affected by many factors, and the following are some important considerations:

(1) In schools with eleventh and twelfth grades, there must be at least one seminar. It is envisioned that there will often be two, and sometimes three.

(2) The most conducive atmosphere generally prevails when there are ten to 25 students in a seminar, and seminars should be limited to 30 students whenever possible.

(3) Many schools ask teachers to help select the participants. Those who would most appropriately have candidates are teachers of mathematics, science and social science, specifically the following: advanced algebra, trigonometry, calculus, physics, chemistry, advanced biology, and advanced social science courses such as sociology, economics, political science and anthropology. If the school decides to use self-selection procedures, attempt to clarify the types of students we want and to have them limit the number of participants for each seminar.

C. Be sure a slide projector and screen will be available.

II. At the School Prior to the Session

A. Prepare slide projector and screen as for large group. [Read parallel section under the large group meeting.]

B. If there is to be a demonstration, assist the woman scientist in setting it up.

C. Check to see that there are enough seats for the projected audience size. Sometimes a few extra desks need to be brought into the room. With smaller groups you may be able to arrange the seats in a circle.

III. During Session

A. If necessary, as students come in, the Field Representative and woman scientist should have students sit toward the front, leaving no large gaps.

B. It is the responsibility of the Field Representative to insure that there is some time available for questions by the students.

In addition to preparing the woman scientist for a reasonably timed presentation, the Field Representative must control her introductory presentation to allow for interaction time. The shorter slide presentation will help, but there will be sessions in which it is necessary to limit remarks even further. Do not be concerned that students may not ask enough questions to fill up the remaining time. If there is time left after questions, there will be other information or modules you can use to fill out the time.

C. Attempt to have students ask questions loudly enough for all to hear. If this does not work, repeat the question (or the basic ideas behind it) so all participants understand it.

FOLLOW-UP MEETING

Description

In most schools in which a large group meeting is conducted there will be at least one follow-up meeting. In many schools, there may be two or three follow-up meetings; and in schools with only ninth grade students, the program for students may consist of one or two large group meetings and several follow-up meetings. The follow-up meetings will generally include a maximum of 30 females.

It is the objective of the program to make follow-up sessions available to ninth and/or tenth grade females who have already shown an interest in science and mathematics and who are particularly interested in exploring science career possibilities. Participants in follow-up meetings may be chosen by school staff based upon demonstrated interest and ability in science and mathematics, or they may be self-selected, using procedures developed by the contact person.

The major purposes of the follow-up meetings are (1) to establish and reinforce the notions that women can be interested and successful in science careers and that they can combine these careers with full private lives, and (2) to provide specific information in response to students' questions. The meeting usually consists of the following (although the order may vary):

(1) a brief overview of the major points from the large group meeting;

(2) one of the three modules;

(3) a presentation by the woman scientist;

(4) a question-and-answer session;

(5) an opportunity for each participant to obtain a copy of the "Thinking About A Career" pamphlet;

(6) and filling out of student forms.

In virtually every case, those who attend a follow-up meeting will have attended a large group meeting. The success of the follow-up meeting is probably dependent upon providing additional information in a lively stimulating manner and providing an opportunity for some questions and answers. The crucial areas of preparation include: working with the school contact person in determining the size of the groups and the selection process; preparing the woman scientist for making an appropriate, brief presentation which does not repeat the points made in the large group meeting; and limiting the Field Representative's activities to insure an opportunity for some audience interaction.

FOLLOW-UP MEETING

Guidelines

I. Telephone Discussion with School Contact Person

A. Determine the location for the follow-up meetings. [Read the parallel section under "Seminars".] In some cases, you may have to use the large group meeting room for follow-up meetings before moving to a separate room for seminars, as this will be operationally better for the school.

B. Determine how many follow-up meetings there will be, approximately how many students will attend each, and how the contact person might select the students. This will be affected by many factors, and the following are some important considerations:

(1) Even in schools with grades 9-12, where there will be seminars, it is envisioned that there will be at least one follow-up meeting, and there may be two of them. In schools with only ninth grade students, there may be a series of three to five follow-up meetings which include nearly all of the students.

(2) Follow-up meetings should generally be limited to approximately 30 students unless the school makes this an issue.

(3) Many schools select the participants by talking with teachers. Those who might most appropriately have candidates are those who teach the most advanced mathematics and science courses available to ninth and tenth grade students. If the school decides to use self-selection procedures, attempt to clarify the types of students we want and to have them limit the number of participants for each follow-up meeting.

C. Be sure a slide projector and screen will be available, if needed.

II. At the School Prior to the Session

[Read parallel section under "Seminars".]

III. During Session

[Read parallel section under "Seminars."]

In follow-up meetings there will generally be very little time pressure as these students have already attended a large group meeting. The Field Representative needs to prepare a very brief overview of the large group session and assist the woman scientist in preparing a brief informal presentation which does not repeat her remarks in the large group session.

STAFF MEETING

Description

In schools where it is possible there will be a brief meeting of several members of the school staff, including at least one representative of the following areas: science, math, social science, counseling, library, and administration. We realize this may not be possible in some schools due to operational problems, but in most schools it will be possible to schedule a meeting with representatives of most of these areas. There is no need to schedule the meeting for more than 20-30 minutes but it should be scheduled for at least 15 minutes.

The major purposes of the meeting are: (1) to describe the purposes of the Visiting Women Scientists Program to those who will be having their classes disrupted, and briefly relate to them the types of activities we conduct and the information we present to students; (2) to acquaint them with the resource packet and other reference materials that are of value to female students; and (3) to encourage them to be sensitive to the purposes of the program and to reinforce the ideas when they have the opportunity in the future.

In the pilot program it was found that a brief meeting that covered the basic points was worthwhile. It provided staff members with knowledge of what the "strangers" are doing in the school, and it allowed whose who wanted it an opportunity to express their opinion or ask questions. Therefore, we have decided to continue the staff meeting as part of the Visiting Women Scientists Program. At the same time, we must remember that a high school schedule is not easily rearranged for setting up such meetings, and teachers have very little "free" time. You should keep the meeting brief and businesslike. After the basic presentation is completed and the group members have had an opportunity to ask their questions, dismiss the general meeting; if you and the woman scientist have some time available so individual staff members who have greater interest in the program can talk with you.

The woman scientist has no specific role in the staff meeting; however, it is important that you make her feel comfortable with the meeting situation, and it is positive for the program when she has an opportunity to contribute to the conversation. Some suggestions for her contributions are presented in the attached guidelines.

Be sure to use this opportunity to invite staff members to drop into sessions during the day. It is important that they feel welcome to do this, and nearly all school staff have had positive reactions to VWSP sessions. Sometimes when school staff members are informed about the program, they respond by having follow-up discussions in classrooms; and occasionally they have discussed the program with students prior to the sessions.

STAFF MEETING

Guidelines

I. Telephone Discussion with School Contact Person

A. There should be a staff meeting in nearly every school. In the pilot program there was a meeting in 80% of the schools. We have become more realistic about time requirements and participants so that it should be easier to schedule. Since we have defined the purposes of the meeting more clearly and developed a good presentation using experience in the pilot program, the meetings have become productive and beneficial for the participants.

Be sure and make our specifications clear to the Contact Person: we want to meet with interested staff for only 15-20 minutes. (They may interpret that we want to meet with many staff members for a long period of time.) Once this has been clarified, a staff meeting can usually be arranged.

B. The best time to conduct a staff meeting will probably be (and should be) based on when the Contact Person can get the most key staff members together for 15-30 minutes. If everything else is about equal, there seems to be some advantage to having the meeting early in the morning. Staff members are generally more receptive; they may be able to attend some sessions later in the day; and they may discuss the program in their classes. However, the Field Representative should not sacrifice valuable school time for student sessions in order to start the day with the staff meeting.

Other times that have been used frequently are: just after the first meeting, which is usually a large group session; sometime during the lunch period; immediately after the last class.

C. We would like to have at least one representative of the following areas: science, math, social science, counseling, library, and administration. The science, math and social science teachers will generally be department chairman. If choices must be made, science and math have priority over social science.

Counselors have flexible schedules, and usually at least one can attend. If there is departmentalization, career counselors tend to be most interested in this program. The librarian may have access to the Occupational Outlook Handbook and may be the person who would order I Can Be Anything, if the school is interested. Also, the library may be a location for one of our resource packets.

If the principal has the time and interest, he or she might be able to encourage staff members to reinforce the ideas of the program. The principal might also encourage teachers to use the films in the resource guides or make the decision to order I Can Be Anything.

Encourage the Contact Person to invite other interested school staff or members of the district staff. They are often interested in the presentation at the staff meeting.

D. The only requirements for a meeting location are enough seats for all participants and a large table or desk for your materials. The library has often been used, as well as the counselor's office or a vacant classroom.

II. At the School Prior to the Meeting

A. This should be arranged as an informal meeting. In a library, you might arrange your materials at one table and have staff members sit at surrounding tables; or you might pull two or three tables together. In a classroom you might pull student desks into a semi-circle around the main desk. Be sure the woman scientist has a seat near you.

B. Arrange your materials for easy reference

a. Display a resource packet and be able to access "Women in Science and Technology" and "I'm Madly in Love with Electricity" as well as the List of Resource Materials.

b. Have your copies of the OOHB and I Can Be Anything to show the participants.

c. Have extra copies of the "Help Wanted" brochure, the yellow informational brochure, and the List of Resource Materials available for those who have received no information.

C. In order to be fully prepared for the staff meeting and to appear very professional to this important audience, you should try to have a few minutes in the room prior to the scheduled starting time to make the necessary arrangements. If this is not possible, be well organized ahead of time and use the first couple of minutes to arrange the room and your materials as you want them. It is very important to be poised, organized, and businesslike during the presentation. It is generally preferable to keep participants waiting for just a couple of minutes while you organize rather than to begin and appear disorganized as you proceed through your presentation.

III. During the Session

A. The Contact Person will probably want to introduce you and the woman scientist. Also, various participants may want to interject comments as you proceed. You can generally move through your "formal" presentation without much interruption and handle the interjections and comments during the question and answer session. However, you should be aware of the possible need to break into your presentation to allow a question or comment.

You may even want to ask a librarian, counselor or teacher to speak very briefly about the availability of related materials at a specific school. It is generally a good idea to have discussed this with that person ahead of time, if you desire to have someone speak.

B. When you introduce the woman scientist, have her say a couple of things about her job and company, as well as something about herself. This should be brief and serve to set the tone for an informal meeting. Also, she may be able to contribute at some other points. Examples are:

1) She may have told you or the students in a session that she was the only girl in her high school chemistry and physics classes in the late 1940's; or she may have said that her high school teachers and parents tried to talk her out of taking science courses. If so, you could have her briefly relate this at appropriate points in your presentation. Prepare her in advance for this so she will be brief and to the point.

2) She may have expressed to you that certain booklets in the resource packet were particularly interesting to her. If so, have her comment.

3) Many women scientists have been very favorably impressed with the attitudes of counselors and teachers toward females today compared to a few years ago, or toward the wealth of materials available. If so, have her comment about this.

4) Staff members sometimes ask several questions at the end of the session. Turn to the woman scientist to see if she has relevant comments in response to these questions.

STAFF MEETING

Sample Narrative

I. Introductions

Welcome to the Visiting Women Scientists Program. I am Mary Ellen Taylor, Field Representative, and I'm pleased to introduce Carole Sawicki who is a Research Chemist at the Environmental Protection Agency working in the area of air pollution. (The woman scientist might then make brief remarks about her job and place of employment.)

I would like for all participants to introduce themselves, giving their titles and departments .... (Be sure and record information on Field Representative Visit Form.)

II. Purpose of the Meeting

The purpose of this meeting is to tell you about the program and enlist your aid in furthering its objectives.

First, let me ask: Did you all receive a memo and brochure outlining the objectives of the Visiting Women Scientists Program? I won't repeat all of the information in those materials but I would like to tell you a little bit more about the program.

This program sponsored by the National Science Foundation is designed to encourage young women to consider careers in the various areas of science. NSF defines science to include engineering, physical science, mathematics, biological science and social science.

Traditionally, many women have not been motivated to take math and science courses in high school that would give them a basis for entering science curricula in college. Although the job outlook is favorable in the sciences, especially engineering and computer science, women have not taken advantage of the opportunities, often due to lack of knowledge about science careers. NSF has recognized that the underrepresentation of women in science careers is a serious waste of national talent.

We would like to take a short time to tell you about the major points of our project and describe the materials that we have put together for you and your students to use. We hope you will comment on our efforts and offer suggestions.

III. Major Points of the Visiting Women Scientists Program

The major points that we are stressing to your students today are:

A. The fact that most women work: 90% at some time in their lives--60% work 30 years or more. Many young women do not plan for a career, consequently they must accept low-paying, unrewarding positions even though they could have succeeded at other jobs.

B. In recent years, job opportunities for women in the sciences have increased considerably. Engineering is a particularly promising field for women. Although presently less than 2% of employed engineers are women, the percentage of women being trained in engineering is much higher--in part due to the high salaries (average starting salary $14,800--many are higher) offered in industry.

C. Many young women think that science courses are out of their reach, when in fact, they are not. One does not have to be a genius to pursue and succeed in a science career. Young boys seem to know this. Many average male students become scientists but women seem to think they have to be geniuses to be scientists.

D. Hopefully, the interaction among the role models and students, along with the information and materials provided by the VWSP will help influence the young women to build a good educational foundation that will enable them to keep their career options open. Our message is not that they choose a specific career at this time, but that they consider science careers and take all of the high school math and science courses they possibly can. We realize, however, that a one-day program cannot accomplish this by itself. One of the purposes of this meeting is to enlist your aid in encouraging your female students to consider careers in the sciences.

IV. Resources

We will encourage the girls to use the following materials. We hope that you will also encourage their use to reinforce our efforts.

A. Resource Packets: Your resource packets provided by the Visiting Women Scientists Program will be located in the library and guidance center. You have received a list of the resource materials contained in the packets to enable you to refer students to the packet for answers to specific career questions. We hope this collection of current career publications and information about financial aid will be helpful. In addition, there is a more extensive guide in the packet that includes an annotated bibliography of materials and films. I would especially recommend "I'm Madly in Love with Electricity" which gives profiles of women in a variety of science areas (hold up a copy of each publication you mention) and "Women in Science and Technology"--the latter being an ACT publication; 50 copies have been given to [contact person]. Other pamphlets are more specific. For example, if a student wants to find out more about engineering there are pamphlets on engineering in general, and women in engineering in particular. We have given each school 2 resource packets. Some schools, particularly larger ones, have indicated they would like an additional packet so they can keep one in the science department as well as the library and guidance center. Would an additional 1 or 2 packets be useful to you? [Record this information on the Visit Record.]

B. The Occupational Outlook Handbook, which is located in your counselor's office is a publication of the U.S. Department of Labor. It is a general reference book providing descriptions of about 850 occupations and gives the following information about each: the nature of the work; places of employment, qualifications needed; earnings and working conditions; job outlook; and sources of additional information.

Another publication, I Can Be Anything: Careers and Colleges for Young Women by Joyce Slayton Mitchell, goes beyond a description of career information and introduces the critical consideration for girls and women: that of life style.

Although your school does not have a copy, your counselor may want to order this excellent publication. Complete information about the book is included in your list of resource materials.

V. Closing Remarks

As a result of teachers' suggestions last year, we are developing a Woman Scientist Roster so that schools will be able to invite additional women scientists to meet with their students. The roster will probably be available next fall; details of the release are not yet finalized.

Research tells us that high school girls need more encouragement than boys to become interested in a science career and that they require reinforcement once their interest has been sparked. As teachers and counselors, your help in these efforts will be most valuable.

Are there any questions or comments?

Thank you again for your time.

CASE STUDY

Guidelines

Have students read the case study and then ask for volunteers to respond to the two questions. As long as the group appears interested and is responding with relevant points, it is probably worthwhile to allow the discussion to continue and maintain the role of discussion leader, in the general sense.

If the discussion lags or if the major issues surrounding the differing assumptions toward males and females do not become clear, the Field Representative can more directly lead the discussion by using some of the following guidelines and questions.

Some points to consider in utilizing this module are:

(1) It only takes about 2-3 minutes for students to read this case study. The entire module will generally be productive for 10-15 minutes.

(2) Your role is a key one; you should be prepared to help keep the discussion moving. Sometimes you will have to lead the discussion through specific questions. Other times, you may have to slow down a lively group and work to focus upon the major points. And occassionally, things will just fall into place.

Be fully prepared for those few occasions when it just will not work at all well, in spite of all your efforts. That is the nature of this type of activity. When this happens, wrap it up gracefully and move on to the next activity as though you planned it that way.

Sometimes this module will come to a natural ending point, but in other instances, the Field Representative may have to bring it to closure because of time limitations or because it will no longer be productive to continue. In either case the Field Representative should have some way of closing the discussion and moving on to the next activity. With this type of activity, it is possible to leave a dangling situation which negatively affects the module and the following activities. Strictly as an example, you might say the following:

> "Well you have certainly made some excellent points about possible ways to resolve this situation while being fair to both Sally and Bob. Our purpose in discussing this with you was to help you become sensitive to the need for all of us to consider the educational and career goals of young women as well as young men. It looks like we all agree that while there are still some problems in this area, the situation has improved and is probably going to continue to improve.
>
> Mrs. Jones from Express Chemical Company will now do the demonstration on combustion I talked about this morning. You can keep your copy of the case study; I don't need those back...."

(3) The woman scientist has no specific role in this module; however, it has been our experience that in many instances, she has been able to contribute meaningful examples at certain points. It is a positive situation when the role model contributes in the more informal activities. Be attuned to the possibility that she might want to contribute; or if a particular example she has used previously would be appropriate, ask her to discuss it. In conjunction with this, the Field Representative should briefly discuss this module with the woman scientist to prepare her for a possible contribution.

CASE STUDY

Possible Questions to Stimulate and Focus Discussion

1. Is it more important for Bob to go to college than Sally?

Most women will work even if they get married. In many cases, married couples choose to delay having children for several years while both work. Also, many families need two incomes, and there is always the possibility that the woman will become sole support of the family because of divorce or death of husband. One engineer who participated in the Visiting Women Scientists Program was married to a policeman who was killed in the line of duty, leaving her as sole support of their 4 month old child. Fortunately she had the necessary training to get a job which provided a good salary.

Also, many women choose to pursue careers that interest them, and for many women science careers are among the most satisfying. Without proper preparation women are forced to settle for less satisfying, lower paying jobs.

2. Should Sally go to college simply because she is older?

There are a lot of ways to help finance college so that both Sally and Bob can have the opportunity to pursue the careers that interest them. Among the possibilities are scholarships, loans, part-time jobs, and cooperative college-work arrangements.

3. Has this situation been true in the past? Do you think people are changing their minds about this?

At the present time as many females as males are entering college, and increasingly more women are entering traditionally male careers. For example, while only 7 percent of the current physicians are women, 17 percent of medical students are women.

4. Do any of you know of examples similar to this and how they were resolved?

5. Why do you think girls tend to concentrate on certain careers such as secretarial, nursing, teaching, library sciences, and social work rather than science and engineering?

Among the points which can be made are:

a. Parents often suggest different occupations for boys and girls who are thinking about what they want to be when they grow up.

Possible Questions (continued)

b. There are very few women scientists as role models.

c. Teachers and counselors sometimes steer girls away from math and science courses.

d. Females have the mistaken notion that they need to be geniuses to succeed in science careers.

e. More points are shown on the attached sheet from a module in the pilot program.

MATCHING

Guidelines

The purposes of the matching exercise are to acquaint students with a variety of science occupations and to raise their interest level in science careers. It was designed to be fairly simple to complete in order for them to feel that they already know quite a bit about science careers.

The module should be passed out to the students, and then time should be provided for them to complete the mathcing activity--usually about seven to ten minutes. Then the Field Representative should lead the group in discussing the answers. The way this is done can vary, and different methods can be used within any one group of students:

(1) Ask the students as a group and repeat the consensus answer.

(2) Ask for a volunteer to match the occupation with the definition.

(3) If time is running short, occasionally just give the correct answer for a specific item.

For variation, if the interest level is high or if there is a lot of extra time, you might do something like the following as you go through the job titles.

(1) "Do any of you know a chemist? A lot of them work locally at Express Chemical Company. Does he/she work with detergents or cosmetics? Like I said, this was just an example. You say your friend works with fertilizers for house plants. She probably works closely with botanists and some agricultural engineers. Are there other women working with her?"

(2) The scientist I worked with last week was a civil engineer. She was the first woman civil engineer to supervise construction of a bridge for the state department of highways. At first the construction workers resented her being at the sites; but after she proved she really knew how to do her job, they accepted her and treat her really well. Now there are two other women doing that job in other parts of the state."

When finished, bring the module to a definite close as you move to your next activity. For example:

"This group really knows science and engineering. There were only one or two which gave you any problems at all. I'm also surprised you have so many friends, including a lot of women who are scientists. That's very encouraging. We like to show students that scientists work on problems that affect all of us everyday, not just high level laboratory research; but this group seems to already understand that.

"Janet Jones, the physicist you met in the large group this morning doesn't work in a laboratory developing mathematical models as our example showed. She combines her training in physics with her love of flying; she actually takes a lot of test flights, doing stress tests on airplanes as they are being designed..."

THINKING ABOUT A CAREER

Guidelines

The objectives of this module are (1) to introduce females to the concept of thinking about careers in general and science careers in particular, and (2) to assist them in taking some initial steps in thinking about careers and selecting some valuable sources of information. It was designed for flexibility in format of presentation and time required.

As presented in the "Sample Narrative" with accompanying slides, this module requires about 15 minutes. However, once you learn the material and are familiar with the slides, it can be used very flexibly to fill in gaps of time in seminars and follow-ups. For example, you might mention the major points and offer the handout, or you might use selected slides to discuss only the resource packet, the Occupational Outlook Handbook, or I Can Be Anything.

Whether you use the module formally or not, you are to make "THINKING ABOUT A CAREER" available at each seminar and follow-up. In doing this, use a paragraph such as the following:

> After our discussions today some of you may be interested in thinking more about a career in science. If so we have copies of a pamphlet which may interest you called "Thinking About A Career in Science and Technology: A Young Woman's Choice" [hold up a copy].
>
> This tells about some references and provides a checklist for starting your planning of a career. If you would like a copy, stop by and pick one up.

The information in this module is appropriate for females in all of the grades 9-12. Our experience has shown that those in grades 11 and 12 are generally more interested in the additional information in the pamphlet. Therefore, be sure to make participants in both seminars and follow-ups aware of its availability.

THINKING ABOUT A CAREER

Sample Narrative

Most young women will work for a number of years and there are many new, exciting job opportunities available to those who qualify. Each young woman today should realize that she can succeed at a variety of careers, including those in science and technology.

It is not essential for you as a high school student to choose and prepare for a specific career. You should, however, spend some time thinking about possible careers, and relating them to your personal interests, abilities and ambitions. This will provide you the opportunity to plan a high school and college program which will prepare you for a job that satisfies your goals and interests.

If you haven't begun to think about career alternatives or study materials related to careers in science and technology, here are some resources you might want to use.

VISITING WOMEN SCIENTISTS PROGRAM RESOURCE PACKET

Packets of resource material have been prepared specifically for this program and are available in your school. One is located in your [library] and the other will be in your [career center]. They contain pamphlets about financial aid and career opportunities in the areas of science, mathematics, social science and engineering.

-Start Slide Show-

[Engineer Slide]	This slide shows a few of the pamphlets describing different areas of engineering, a particularly good field for women and minorities.
[Math & Social science]	Here are some of the pamphlets that describe careers in mathematics and the social sciences. [Possibly point out one or two by title.]
[Bkgd Slide]	Two especially good pamphlets you see in this slide are "I'm Madly In Love With Electricity" and "Women in Science and Technology." There are also several good sources of financial aid included in the packet.

I CAN BE ANYTHING

[I Can Be Anything Slide]

Another excellent resource is a book by Joyce Slayton Mitchell titled I Can Be Anything: Careers and Colleges for Young Women. [At this point, show your copy of I Can Be Anything.]

In addition to describing a large number of careers, this book encourages women to consider the concept of life style as they think about career alternatives. The author includes examples of working women in various careers and discusses the future for women in those careers.

[ICBA Info Slide]

For each occupation this book discusses the following: What it is like to work at that job; how many women are in the field and where they work; what the salaries are; the future for women in the job; what colleges award the most degrees to women in the field; and where more information can be obtained.

THE OCCUPATIONAL OUTLOOK HANDBOOK

[Occ. OutL Handbook]

This "encyclopedia of careers" is published by the U.S. Department of Labor, Bureau of Labor Statistics. It is available in most school and public libraries. In your school, a copy is available in the [counselor's office]. (Show your copy of Handbook.)

[OOHB Reprints Slides]

The Handbook includes information about 850 jobs and more than 30 major industries. In the table of contents, most science, mathematics, and engineering occupations are listed under "Science and Technical Occupations;" there is also a section on "Social Scientists." The following examples show just a small sample of the information you can obtain in the Occupational Outlook Handbook.

[OOHB Info Slides]

Nature of the Work

- Civil engineers design and supervise the construction of roads, bridges, airports, and buildings.

Places of Employment

- Most anthropologists, geographers, and political scientists work in colleges and universities while most statisticians and economists work in private industry or research organizations.

Places of Employment (continued)

- For science majors, there are more jobs with higher salaries in industry than in academia. Several of the scientists involved in the 1977-78 VWSP were employed in industry. For example: Katherine Daues, a geophysicist is involved in oil and gas exploration for Superior Oil. Judy Benham, a chemist, prepares new organic materials and evaluates them for 3M.

Training, Qualifications and Advancement

- A bachelor's degree in engineering is the usual requirement for a beginning engineering job.

- A doctoral degree is almost always required for a job as an astronomer or a psychologist.

Job Prospects Through the Mid-1980's

- The outlook for graduates of computer-related curriculums should be excellent.

- The number of persons who will graduate with advanced degrees in sociology is likely to exceed available job openings.

Salary and Working Conditions

- Biologists with a bachelor's degree and no experience had an average starting salary of $10,200 in private industry in 1976, while the average starting salary for engineering graduates was $14,800 a year.

Sources of Additional Information

- Lists of schools offering education in forestry are available from the Society of American Foresters, with addresses listed.

-End of Slide Show-

I think you will find the Occupational Outlook Handbook very useful when you are exploring various careers. It is an excellent reference to use first, and it will lead you to other resources.

SCHOOL COUNSELORS

In addition to the sources mentioned and depending upon the organization of your school, there may be guidance counselors, career counselors, or both available to you. Part of their job is to assist individual students in thinking about future careers and how to prepare for them. The counselors have been trained to help you in thinking about careers, and they have many materials available which can help you.

School counselors are often very busy people with many different jobs and responsibilities. It is possible that they will not have the time to take the initiative to work with each student in discussing a career. However, if you wish to discuss your career alternatives with your counselor and take the initiative to make an appointment, it is very likely that he or she will assist you with personal discussion and useful materials available in your school or public library.

A great deal of the information just presented is included in this booklet (show copy to students) "Thinking About A Career." In addition, you will find a list of steps for you to take in starting to plan a successful career. If you are interested, you may pick up a copy at the end of the class period.

We have now "introduced" you to several women in science careers through slides and in person. We have also discussed the reality of women working, mentioned career areas that have a particularly good employment outlook and outlined how you can begin to seek further information. We hope you will find this information helpful in your career planning and decision making process. Are there any questions?

Study Guides

By now you're aware that the materials about science careers we have provided contain more information than you can reasonably be expected to absorb in such a short period of time. The following study guides will help you focus on the information we consider most important. This does not mean you need to memorize these facts but it does mean you should become thoroughly familiar with this information.

The guides are organized into 4 areas:

1. Information About Science Careers
2. Information About the Employment of Women
3. Science Employment in Your Geographic Area
4. Preparation for Science Careers

If you have not already done so, please read the materials described in the letter of December 15 before you begin these exercises. Next, unless you are instructed otherwise, try to complete each exercise without references; then check your responses using the appropriate resources. This procedure should give you a good idea of the areas where you need further study.

A. Information About Science Careers

1. Define (or give examples of the work done by) each of the following types of scientists:

   a. Biochemist

   b. Systems Analyst

   c. Ceramic Engineer

   d. Biomedical Engineer

   e. Forester

   f. Meteorologist

   g. Ornithologist

   h. Physiologist

   i. Molecular Physicist

   j. Organic Chemist

   k. Crystallographer

   l. Paleontologist

   m. Anthropologist

   Refer to the Occupational Outlook Handbook reprints, the Science Career Briefs, and I Can Be Anything to check your answers and/or complete your responses.

2. Approximately how many persons are employed in each of the following occupations?

(Check one.)

	5,000 or less	5,001 -100,000	100,001 -500,000	500,001 1,000,000	More Than 1 Million
a. Anthropology					
b. Astronomy					
c. Biology					
d. Chemistry					
e. Computer Programming					
f. Economics					
g. Engineering (Total)					
h. Geology					
i. Physics					
j. Psychology					

Check your answers against the information provided in Table 4.

3. While there are 25 major branches of engineering, more than three-fourths of all engineers are employed in one of four branches. List these four major branches of engineering and give an example of the work involved in each.

	Branch of Engineering	Example of Work Performed
a.		
b.		
c.		
d.		

Refer to Table 4, the Occupational Outlook Handbook reprints, the Science Career Briefs and I Can Be Anything to check your answers.

4. Indicate if the employment outlook for each of the following occupations is favorable or unfavorable.

		(Check one.)	
		Favorable or Very Favorable	Unfavorable
a.	Chemical Engineer		
b.	Civil Engineer		
c.	Electrical Engineer		
d.	Industrial Engineer		
e.	Mechanical Engineer		
f.	Petroleum Engineer		
g.	Biochemist		
h.	Chemist		
i.	Geologist		
j.	Life Scientist		
k.	Oceanographer		
l.	Physicist		
m.	Computer Programmer		
n.	Mathematician		
o.	Statistician		
p.	Systems Analyst		
q.	Anthropologist		
r.	Economist		
s.	Geographer		
t.	Political Scientist		
u.	Psychologist		
v.	Sociologist		
w.	Elementary School Teacher		
x.	Secondary School Teacher		
y.	Social Worker		

Check your answers against the information provided in Table 5.

5a. List 2 science occupations where many jobs are available to persons with 4-year college degrees.

1. _____

2. _____

b. List 3 science occupations where doctoral degrees are generally required for employment.

1. _____

2. _____

3. _____

Refer to the Occupational Outlook Handbook reprints and I Can Be Anything to verify your responses.

6. For each of the following occupations, indicate if the primary place of employment is private industry or academia.

(Check one.)

	Industry	College or University
a. Anthropologist		
b. Astronomer		
c. Chemist		
d. Computer Programmer		
e. Economist		
f. Engineer		
g. Life Scientist		
h. Mathematician		
i. Sociologist		
j. Statistician		

Check your answers against the information provided in Table 5.

B. Introduction About the Employment of Women

1. Approximately what percentage of women will work outside their homes at some time in their lives?

____ %

2. Approximately what percentage of women will work for 30 years or more?

____ %

3. Approximately what percentage of women will become heads of households due to divorce or death of husbands?

____ %

Refer to the Outline of the Field Representative's Introduction in the Activities section of the notebook to check your answers to questions 1-3.

4. Approximately what percentage of persons employed in the following occupations are women?

(Check one.)

	<2%	2-5%	6-15%	16-25%	26-50%	51-75%	>75%
a. Anthropology							
b. Astronomy							
c. Biology							
d. Chemistry							
e. Computer Programming							
f. Elementary School Teaching							
g. Engineering							
h. Physics							
i. Psychology							
j. Secretarial							
k. Social Work							

Check your answers against the information provided in Table 1 in the "Statistics on Science Careers" section of your notebook.

C. Science Employment in Your Geographic Area

1. List several companies in your area which employ large numbers of scientists.

_____

_____

_____

2. According to the Classified Advertisments in your local newspapers, which science occupations have the largest number of job openings?

_____

_____

_____

3. For each of the following occupations, list a company in your area which employs these persons and give a brief example of the work performed. (Do the best you can; perhaps make a few calls to people you know in major companies.) Try to get examples which you will feel comfortable using when you talk to students.

	Company	Work Performed
a. Chemical Engineer		
b. Civil Engineer		
c. Electrical Engineer		
d. Industrial Engineer		
e. Mechanical Engineer		
f. Chemist		
g. Physicist		
h. Computer Programmer		
i. Biologist		
j. Economist		
k. Statistician		

D. Preparation for Science Careers

1. List the colleges in your area which enroll substantial numbers of graduates from local high schools.

_____

_____

2a. Using I Can Be Anything as your resource, complete the following chart by listing the colleges in your local area, your state, and nearby states which award the most Bachelor's Degrees in each field to women. This chart will serve as a useful resource when you talk to students. (You might also skim the lists for master's and doctoral degrees to see if nearby colleges are mentioned.)

Area of Science	Colleges Awarding the Most Bachelor's Degrees in Each Field to Women		
	Local	Your State	Nearby States
1. Engineering			
2. Chemistry			
3. Physics			
4. Computer Programming			
5. Mathematics			
6. Ecology			
7. Zoology			
8. Anthropology			
9. Geography			
10. Psychology			
11. Sociology			

It is likely that colleges near you have a number of strong science departments whether or not they currently award many degrees to women. Use the space below to record information about the science programs in colleges near you. For example, where is the nearest engineering degree program? Does one of the colleges offer a special program in marine biology? etc., etc.

_____

_____

_____

_____

2b. Use the catalogues of major colleges or universities in your area to complete the following chart. (Requirements may be stated in terms of years of courses rather than names of individual courses.)

Major Area	College or University	Course Prerequisites For Admission	Math and Science Courses Needed for Degree
A. 4 Year Degrees			
1. Biology	1.		
2. Engineering	2.		
3. Mathematics	3.		
4. Psychology	4.		
B. Master's Degrees			
1. Chemistry	1.		
2. Computer Science	2.		
C. Doctorate			
1. Anthropology	1.		
2. Physics	2.		

Table 1

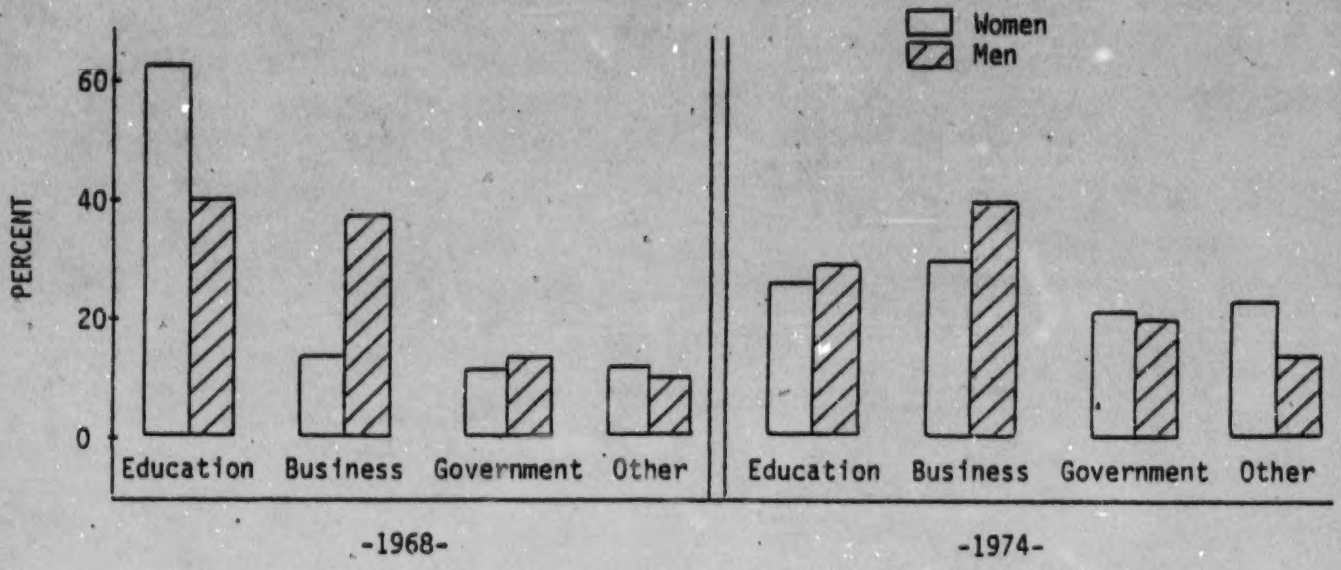
PARTICIPATION OF WOMEN IN EACH OF A NUMBER OF CAREERS

Occupation	Approximate Percent Women[1/]
Engineering	2
Physics	4
Astronomy	7
Chemistry	11
Anthropology	20
Biology	20
Mathematics	20
Computer Programming	22
Psychology	41
Secondary School Teaching	50
Social Work	61
Elementary School Teaching	85
Secretarial	95

[1/] From I Can Be Anything: Careers and Colleges for Young Women, Joyce Slayton Mitchell. College Entrance Examination Board, New York, NY., 1978.

Table 2

DISTRIBUTION OF MEN AND WOMEN IN SCIENCE
BY MAJOR TYPE OF EMPLOYER: 1968, 1974



SOURCE: National Science Foundation, Women and Minorities in Science and Engineering, 1977.

Note that in 1968, over 60% of women were employed in education while only about 15% were employed in business; by 1974; the percent of women employed in education was reduced substantially, and the employment of women had increased in private industry and the government.

Table 3

APPROXIMATE AVERAGE BEGINNING ANNUAL SALARY OFFERS,
BACHELOR'S DEGREE, 1975-76

Degree Field	Offer
Engineering	$14,500
Chemistry	12,500
Computer Science	12,500
Physical & Earth Science	12,500
Mathematics	11,800
Biological Science	9,500
Social Science	9,200

SOURCE: The College Placement Council, Salary Survey, Final Report, July 1975 and July 1976.

Also note that 1978 salary figures show wide discrepancies between traditionally male and traditionally female careers. Example: Average annual salary for a beginning petroleum engineer is $19,776 compared to $9,948 for a person with a degree in humanities.

Table 4

TOTAL NUMBER OF SCIENTISTS EMPLOYED IN VARIOUS CAREERS

Engineering:	**Total 1.1 million**
Selected Branches	
Electrical	300,000
Industrial	200,000
Mechanical	200,000
Civil	155,000
Aerospace	50,000
Chemical	50,000
Petroleum	20,000
Agricultural	12,000
Biomedical	3,000
Life Science:	
Selected Branches	
Biology	71,000*
Ecology	48,000*
Biochemistry	12,000
Physical Science:	
Selected Branches	
Chemistry	150,000
Physics	48,000
Astronomy	2,000
Mathematics:	
Selected Branches	
Computer Programming	230,000
Systems Analysis	160,000
Mathematics	38,000
Statistics	24,000
Social Science:	
Selected Branches	
Economics	115,000
Psychology	90,000
Sociology	19,000
Political Science	14,000
Anthropology	3,500
Environmental Science:	
Selected Branches	
Geology	34,000
Meteorology	5,500
Oceanography	2,700

SOURCES: Occupational Outlook Handbook, except those with an asterisk (*) came from I Can Be Anything.

Table 5

EMPLOYMENT OUTLOOK FOR VARIOUS CAREERS

Very Favorable	
Agricultural Engineer	Petroleum Engineer
Biomedical Engineer	Computer Programmer
Ceramic Engineer	Systems Analyst
Industrial Engineer	Geographer
Metallurgical Engineer	Geologist
Mining Engineer	Geophysicist

Favorable	
Chemical Engineer	Food Scientist
Civil Engineer	Forester (with advanced degree or experience)
Electrical Engineer	Life Scientist (with advanced degree)
Mechanical Engineer	Meteorologist
Biochemist	Physicist
Chemist	Statistician

Unfavorable	
Anthropologist	Political Scientist
Astronomer	Psychologist (bachelor's degree)
Economist (bachelor's degree)	Social Worker (bachelor's degree)
Geographer (bachelor's degree)	Sociologist
Mathematician	Soil Scientist
Oceanographer (bachelor's degree)	Elementary School Teacher
	Secondary School Teacher

SOURCE: Occupational Outlook Handbook, 1978-79, U. S. Department of Labor, 1978.

Table 6

PLACES OF EMPLOYMENT FOR
VARIOUS TYPES OF SCIENTISTS

Primarily Employed in Private Industry
Engineers
Economists
Statisticians
Chemists
Computer Programmers
Geologists
Systems Analysts
Primarily Employed in Colleges and Universities
Anthropologists
Astronomers
Political Scientists
Sociologists
Mathematicians
Life Scientists

SOURCE: Occupational Outlook Handbook, 1978-79, U.S. Department of Labor, 1978.

Note that employment outlook is related to type of employment. Those fields where most persons are employed in industry generally have a more favorable employment outlook than those where most persons are in academia.

SUMMARY OF FIELD REPRESENTATIVE RESPONSIBILITIES

I. Prior to the Visit

A. Phone contact with School Contact Person -- At least two full weeks prior to the scheduled visit date, call the School Contact Person. Introduce yourself and confirm that he or she has received the School Contact Person letter and accompanying materials and that the scheduled date is acceptable. (If those materials have not been received or if the date is unacceptable, it will be necessary to terminate the call explaining that you will check into the causes for the problem. Immediately call Carol Place who will determine the problem and contact you when it has been resolved, with instructions concerning your next step.)

After thanking the Contact Person for participation, you should complete the tasks associated with the attached form, "TELEPHONE CONTACT SUMMARY: SCHOOL CONTACT PERSON." Complete one of these forms for each school. The following comments refer to sections of the form:

1. School Information Form (Green) -- If the form has been completed and mailed, thank the Contact Person and proceed with scheduling. If the form has not been returned to RTI, you must obtain the answers to questions 2a and 2b (number of copies of the school memorandum and the exact name and title of the Contact Person) and relay that information to Carol Place immediately. In addition, if the Contact Person can provide you with the rest of the information, record it on one of your extra forms and relay it to Carol Place. If not, ask the Contact Person to please complete the form and mail it to RTI as soon as possible.

2. Schedule -- The information obtained for this section will become your school schedule. For each type of meeting be sure and discuss the various concerns covered in the guidelines, and use the "Remarks" section to indicate problems or to remind you of the specific situation. The following are examples of topics:

   a. Large Group: Projector and screen, amplification/ acoustics, lighting, length of school period, how students will be selected, number of teachers to monitor

   b. Seminar or follow-up: Projector and screen, size of room, number of students, how students will be selected, facilities for demonstration

   c. Staff meeting: Location, who will attend, length of meeting

3. Miscellaneous -- The concerns noted have proven to be important in the past; and you will probably find other important considerations as you conduct visits.

4. Summary of Calls -- This is a necessary, and crucial, reminder of conversations completed when making future calls to the Contact Person. Also RTI may need this information to help determine the number of calls needed to finalize arrangements with schools for programs of this type. Note that you will need to make a final confirmation call during the week prior to the visit to be sure the schedule and arrangements have been completed and are acceptable.

   Be sure to give the Contact Person your name and telephone number, as well as the times you can most likely be reached there. Also inform the Contact Person that he/she can call Carol Place (collect) at the number in the Contact Person letter if you cannot be reached.

   Although you will sometimes be able to complete the school schedule and feel reasonably comfortable after one telephone call, in many cases you will have to make as many as 4 or 5 calls to set a schedule and feel comfortable that the school is ready for your visit. Remember that the success of the visit is very dependent upon both your relationship with the School Contact Person and your ability to establish an appropriate visit schedule for each school.

B. Phone Contact with Woman Scientist -- After conversations with school contact persons and all schedules have been arranged, call the woman scientist. (If there are problems which delay scheduling every school, be sure to call the woman scientist no later than two weeks before the visit. You can discuss these specific problems in later calls.)

   1. Introduce yourself, thank her for her interest and participation in VWSP

   2. Confirm the dates of visits and school names and provide her with the following:

      a. Your telephone number and address as well as the times you can most likely be reached there

      b. Names of school contact persons. (Provide the telephone number of the contact person at the first school to be visited in case of a problem prior to that visit.)

3. Discuss demonstration and/or presentation. Give her examples of previous demonstrations, what generally works well with students, and encourage her to develop a demonstration or materials (charts, pictures, artifacts, etc.) instead of relying completely on a verbal presentation and slides. Advise her to avoid technical language and to try relating to the students at their level.

4. Give her an example of a "typical day", including the approximate length of her presentations. Tell her the length of class periods in schools she will visit. Discuss the needs for varying presentations in large groups, follow-ups, and seminars. Also discuss any unique characteristics of specific schools (especially the first school to be visited) which might affect her preparation. For example, the percentage of students who attend four-year colleges may be relevant, or the precentage of minority students.

5. Explain the staff meeting and her role in that meeting

6. Mention the modules you may use and explain her role in them. (You may elaborate upon this during the visits)

7. Verify infomation you know about the scientist to weave into your introduction. You may want to gain some new information which would be interesting to school staff and students.

8. Mention the importance of keeping school personnel satisfied. The visitors must remain flexible.

9. Give her very specific directions to the first school or to the place you first plan to meet.

10. During the week prior to the first visit, call the woman scientist a second time. If she appears to be well along in her preparation and comfortable with her role, this call will be only for confirmation. If she expresses concerns or if you detect potential problems, try to assist her through discussion and offer to talk with her as needed by telephone. If you feel it is necessary, offer to meet with the woman scientist to discuss the visit and sessions. Based upon previous experience, it is not generally necessary to meet personally with the woman scientist to have a successful first visit; however, in specific instances this may be necessary.

11. After the woman scientist's first school visit (and even during the first visit) the Field Representative can be very helpful in improving the woman scientist's presentations. In most cases this can be done in a positive manner through mutual discussion or by stressing her most effective techniques, examples and ideas.

II. During the Visit

A. Materials (See attached School Visit--List of Materials Needed - Gold)

B. Specific Duties

1. Meet Contact Person and give him/her the blue Record of Visit Form and return envelope. Be sure of schedule for the day, etc. Find out Resource Packet locations and if the school has an Occupational Outlook Handbook and copy of I Can Be Anything.

2. Staff Meeting

a. Set up materials in preparation for meeting

b. Introduce yourself and woman scientist; woman scientist briefly describes her place of employment and position

c. Record on Visit Record (yellow) number of each type of staff

d. Make brochures, List of Resource Materials available to those who never received them

e. Present purposes of staff meeting and of VWSP

f. Present major points to be stressed to students

g. Discuss resources available to students

h. Encourage staff members to reinforce program goals

3. Large Group (9th and/or 10th grade)

a. Pass out "Help Wanted" brochure

b. Introduction, including slide presentation (15 minutes)

c. Introduce woman scientist, then she speaks or presents information

d. Field Representative Wrap-up with encouragement, direct students to available resources, ACT, Resource Packet

e. Fill out Meeting Activity Record (Pink)

4. Follow-Up Meeting

a. Recap large group points briefly

b. Questions and answers

c. Module, woman scientist slides or demonstration, and Field Representative's remarks

d. Hand out Student Forms (Green) for completion

e. Make "Thinking About A Career" available

f. Fill out Meeting Activity Record (Pink) and be sure to attach to the Student Forms

5. Seminar

a. Hand out "Help Wanted" brochure

b. Introduction, including short slide presentation

c. Woman scientist demonstration, talk (shortened)

d. Questions and answers

e. Hand out Student Forms for completion

f. Fill out Meeting Activity Record (Pink) and be sure to attach to Student Forms (Green)

g. Make "Thinking About A Career" available

III. Following the Visit

1. Complete Visit Reocrd (Yellow) and attach to Meeting Activity Records and Student Forms for that school

2. Send Visit Records along with Meeting Records and Student Forms to RTI at the end of each week

3. Send a thank-you note to woman scientist

4. Send a thank-you note to contact person

5. Send an invoice to RTI every two weeks with receipts

TELEPHONE CONTACT SUMMARY
SCHOOL CONTACT PERSON

School:_____ Contact Person:_____

Visit Date: _____ Telephone: _____

Woman Scientist:_____

I. Has School Information Form been completed and sent to RTI?

☐ Yes

☐ No Action Taken:_____

_____

II. SCHEDULE

	Meeting Time	Location	Meeting Type*	Remarks
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____

* L = Large Group, F = Follow-Up, S = Seminar, ST = Staff Meeting

(OVER)

III. MISCELLANEOUS

A. Directions to school, parking and contact person:

B. Arrangements to meet woman scientist:

C. Other:

IV. SUMMARY OF CALLS--CONTACT PERSON

	Date	Person	Remarks
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____

Final confirmation call (during week prior to visit):

Date: _____ Remarks: _____

V. SUMMARY OF CALLS--WOMAN SCIENTIST

	Date	Remarks
1.	_____	_____
2.	_____	_____
3.	_____	_____

SCHOOL VISIT-LIST OF MATERIALS NEEDED

- ☐ School Contact Person Record of Visit Form (Blue) and Return Envelope
- ☐ Field Representative Visit Record (Yellow)
- ☐ Field Representative Meeting Activity Records (Pink)
- ☐ Slides and Slide Carousel for Introduction
- ☐ "Thinking About A Career" (Beige, approximately 100) and Slides
- ☐ "Help Wanted" Brochure (White, approximately 250)
- ☐ Examples of Science Careers, Matching Exercise (Blue) (approximately 75)
- ☐ Career Decisions Case Study (Gold, approximately 50)
- ☐ Student Forms (Green, approximately 150)
- ☐ Lists of Resource Materials (Blue, approximately 10)
- ☐ Pencils for Students to Fill Out Forms
- ☐ Occupational Outlook Handbook
- ☐ I Can Be Anything
- ☐ Yellow Informational Brochures (10)

VISITING WOMEN SCIENTISTS PROGRAM

FIELD REPRESENTATIVE MEETING ACTIVITY RECORD

School ID: _____

School Name: _____

Woman Scientist: _____

Meeting Number: 1 2 3 4 5 6 7 8

1. Large Group 2. Follow-Up 3. Seminar 4. Other (Describe)

Number of Females Grade						
≤8	9	10	11-12	Total Number Females	Number of Males	Total Number Students
____	____	____	____	____	____	____

Activities Conducted:
(Circle all that apply.)

Field Representative

1. Module 1: Introduction
2. Module 2: Slide Presentation
3. Module 3: Thinking About a Career
4. Module 4: Definitions of Science Careers - Matching
5. Module 5: Case Study, Career Decisions

Woman Scientist

6. Slides
7. Demonstrations
8. Other (Describe)

Field Representative and/or Woman Scientist

9. Question and Answer Session (≥10 minutes)

(Attach this form to Student Questionnaires for this meeting.)

VISITING WOMEN SCIENTISTS PROGRAM
FIELD REPRESENTATIVE VISIT RECORD

School ID: _____ School Name: _____ State: _____ Date of Visit: _____

Woman Scientist: _____ Contact Person: _____ Title: _____

Staff Meeting

(Check here if there was no meeting ☐.)

	Number
a. Counselors	_____
b. Librarians	_____
c. Science Teachers	_____
d. Mathematics Teachers	_____
e. Social Science Teachers	_____
f. Principal	_____
g. Vice Principal	_____
h. Others (Specify)	
_____	_____
_____	_____

Resource Packet Locations

(If additional resource packets were requested, specify how many._____)

	Number Located In
a. Library	_____
b. Guidance Office	_____
c. Career Center*	_____
d. Science Department	_____
e. Mathematics Department	_____
f. Social Science Department	_____
g. Other (Specify)	
_____	_____
_____	_____

*if a different location from guidance office

Briefly describe the woman scientist's presentations, demonstrations, etc., and how well they were received. (Attach a separate sheet if you need more space.)

Briefly describe any problems which were encountered during the visit.

Meeting Numbers	Female Students Grade <8	9	10	11-12	Total # Females	Total # Males	Total # Students
Large Group							
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
TOTAL NUMBER LARGE GROUP							
_____	___	___	___	___	_____	_____	_____
Seminar							
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
TOTAL NUMBER SEMINAR							
_____	___	___	___	___	_____	_____	_____
Other							
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
TOTAL NUMBER OTHER							
_____	___	___	___	___	_____	_____	_____

	Female Students Grade <8	9	10	11-12	Total # Females	Total # Males	Total # Students
	___	___	___	___	_____	_____	_____
Follow-Up Meeting							
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
_____	___	___	___	___	_____	_____	_____
TOTAL NUMBER FOLLOW-UP							
_____	___	___	___	___	_____	_____	_____
TOTAL NUMBER MEETINGS							

1979

VISITING WOMEN SCIENTISTS PROGRAM

FIELD REPRESENTATIVE EVALUATION FORM

1. Please discuss the training session here at RTI in terms of preparing you for actual visits, answering your questions, etc. We are particularly interested in methods and materials that were particularly helpful and in those that you feel should be improved. Specific areas for comment includes worksheets at home, field trial visits, staff discussions, written materials, and actual calls to contact persons and women scientists. Please discuss your experiences with the structured field representative introduction and slide presentation. How were they received? How might they be improved?

(MORE)

2. How often and under what conditions did you use the following modules? How well were they received and how valuable did you perceive them to be?

   a. The matching module:

   b. "Thinking About A Career:"

   c. The Case Study:

3. What types of meetings do you feel worked best (large group, seminar, follow-up, mixed)? Why?

4. Please talk about your overall experience with staff meetings. What ideas can you offer for providing further information to teachers and counselors?

(MORE)

5. What did you find to be the most frequent problems in your preparation of schools and women scientists and in your visits?

6. Please provide us with any comments you have or reactions of students or school staff about informational materials provided by the program: "Careers in Science and Technology;" "Thinking About a Career:" and the yellow informational brochure. Were they valuable? How could they be improved? Were there important gaps in information?

7. Were the administrative forms clear and concise for easy completion? Discuss any specific problems you had in completion.

8. How well prepared do you feel schools were for the visits? Can you make any suggestions for improving the preparation process?

(MORE)

9. How well prepared were the women scientists with which you worked? Overall, how effective were they in encouraging females into science? How might their preparation be improved?

10. Do you have any suggestions as to the characteristics of women scientists that seem particularly effective in high school visits?

(MORE)

11. Do you have suggestions regarding the role of the field representative in such a program?

12. Any other comments?

THANK YOU FOR SHARING YOUR TIME, YOUR SUGGESTIONS AND VALUABLE INSIGHTS.
GOOD LUCK IN YOUR FUTURE ENDEAVORS.

O.M.B. No. 99-R0310
Approval Expires 5/31/82

1978-79 VISITING WOMEN SCIENTISTS PROGRAM
STUDENT FORM

Name of School: _____ Date of Visit: _____

1. Please indicate your grade:

(Circle one.)

7 8 9 10 11 12 Other

2. Please indicate your sex:

(Circle one.)

1. Female 2. Male

3. How would you rate this Visiting Women Scientists Program overall?

(Circle one.)

1. Excellent 2. Good 3. Fair 4. Poor

4. How valuable was the program to you in each of the following ways?

(Circle one on each line.)

	Not Valuable	Somewhat Valuable	Very Valuable
a. Taught me about a number of careers of which I hadn't been aware	1	2	3
b. Showed me that women can successfully combine careers and family lives	1	2	3
c. Taught me about the preparation needed for various science careers	1	2	3
d. Showed me the importance of keeping my options open by taking science and mathematics courses in high school	1	2	3
e. Encouraged me to seek further information about science career opportunities	1	2	3

5. Which parts of the program did you particularly like?

(Circle one on each line.)

	Did Not Like	Liked Somewhat	Liked Very Much	Does Not Apply
a. Women scientists' talks	1	2	3	
c. Slides of women in various science careers	1	2	3	4
c. Learning about careers for women in science	1	2	3	4
d. Opportunity to have questions answered	1	2	3	4

APPENDIX E

Woman Scientist Training Letter
Visiting Women Scientists Program Application Form
Woman Scientist Record of Visits

[Date]

[Woman Scientist's
Name and Address]

Dear [Woman Scientist]

We are delighted that you will be participating in the National Science Foundation's Visiting Women Scientists Program. The program is designed to encourage junior high and high school females to consider careers in science and technology. (Please note that NSF defines science to include mathematics, engineering, and social science, as well as biological and physical science.) The pilot Visiting Women Scientists Program conducted last year was quite successful, and we hope to build upon those experiences to have an even better program in 1978-79. I am enclosing a yellow brochure which describes the purposes and procedures of the 1978-79 program.

The objectives established for the Visiting Women Scientists Program are as follows:

1. To provide an opportunity for high school students to meet and interact with women scientists as role models.
2. To provide examples of women in a variety of science careers.
3. To provide evidence of women who have combined personal lives and successful careers in a variety of ways.
4. To promote the attitude that virtually all careers, including those in science and technology, are appropriate for women as well as men.
5. To provide information about science and technology job opportunities for women in the future (including emerging careers), and about equal opportunity laws and affirmative action programs which guarantee women access to these opportunities.
6. To provide information about the preparation needed for various science careers, the importance of keeping various options open, and the sources of financial aid which are available for obtaining this preparation.
7. To encourage students to seek additional information about women in science careers, and to provide assistance in obtaining such information.
8. To encourage teachers and counselors to provide support and encouragement to women who are considering science careers.

To accomplish these objectives, you and an RTI Field Representative will be meeting with students, teachers, counselors, and librarians in each school. You are scheduled to conduct visits the week of _____. The schools and dates for your school visits are as follows:____ Any changes in this schedule will be confirmed by the Field Representative when you speak with her. Each one-day visit will consist of some combination of the following meetings:

1. a large group presentation to as many as 150 ninth and tenth grade female students (in large schools there may be more than one large group meeting);

2. one or more meetings with small groups of students as a follow-up to the large group meeting;

3. one or more seminars, each consisting of 20-30 eleventh and twelfth grade female students who have particular interest in science and mathematics; and

4. a meeting with counselors, librarians, and science, mathematics, and social science teachers, when possible.

Your responsibilities in each of these meetings are discussed below.

1. Large Group Meeting of 9th and 10th Grade Female Students

Each large group meeting will consist of formal presentations by the Field Representative and the woman scientist. The Field Representative will begin the meeting by presenting a brief overview of the program's purposes and making a few major points: more women are entering the traditionally male fields of science and engineering; because of new attitudes and federal laws there are many opportunities for women in the sciences; one does not have to be a genius to succeed in a career in science or engineering, but high school females should definitely take electives in science and math in order to have the option of entering these careers later, and there are materials readily available for use in learning more about career opportunities. [The outline of the Field Representative's introductory remarks is included in Module 1.] The Field Representative will then give a brief slide presentation [(see Module 2)] to illustrate women in a diversity of science careers. It is anticipated that these two activities will take approximately 15 minutes.

At this point the Field Representative will turn the program over to you. You will need to be prepared to talk about various aspects of your career and your life. While you will probably spend no more than 15 or 20 minutes speaking to any one group of students, you should have enough prepared so that you can vary your presentations somewhat. If you kept repeating the same remarks to several groups in each school it is inevitable that you would begin to lose some of your sparkle.

We strongly recommend that you include as part of your presentation a demonstration or materials to illustrate some job-related activity. In the pilot program we found that women scientists who made use of such "show and tell" devices generally had an easier time motivating the students.

Many women scientists in the pilot program were able to demonstrate aspects of their work. For example, an engineer assembled a miniature water treatment system and showed how it removed minerals from hard water. Another used a portable air monitoring device to determine levels of various chemicals in the school. A chemist brought photographic plates and developed them. A sociologist illustrated the use of surveys to collect data by conducting an informal survey of the students' role expectations. A mathematician showed how the "Golden Rectangle" has been used in great works of art over the centuries. An environmental

scientist brought a set of line drawings which illustrated how diseases are spread and discussed how her work in sanitation control helped prevent this spread. A computer scientist brought along both a slide rule and a mini-computer; although she could not hook up the computer, it served as an effective prop for her discussion about emerging careers.

There are several points to keep in mind as you consider what to demonstrate. Often the simplest demonstration is the most effective. Be sure your demonstration is something which will be of interest to high school students and at a level they can understand; the Field Representative will be able to advise you about the appropriateness of the demonstration you are considering. Please resist the temptation to use the occasion to teach the students science or mathematics in an obvious fashion; a couple of women scientists attempted this in the pilot program with unfortunate results. Plan to use only materials which you can bring with you to the school, and make sure all students in the room will be able to see what you are doing. (Some demonstrations might be inappropriate for large group meetings but excellent for smaller meetings. For example, demonstrations which actively involve the students in handling equipment are very effective, but these should not be attempted in large group meetings.)

A number of women scientists in the pilot program used slides to demonstrate aspects of their jobs, while others showed slides of people they work with. This latter approach was particularly effective since it gave the women scientists an opportunity to show examples of a number of different jobs which require different skills and varying levels of education. They were also able to show women with differing personal situations, and women working with (and sometimes supervising) men as well as other women.

2. Follow-up to the Large Group Meeting

Schools have been asked to allow interested students who attend the large group meeting to participate in a small-group follow-up meeting. This will give those students an opportunity to ask you questions about your career and your life. If you have a demonstration which you were unable to use with the large group you may wish to use it in this meeting. If time permits, the Field Representative will explain to the students how they can go about seeking additional information about science career opportunities [See Module 3].

3. Seminars for 11th and 12th Grade Female Students

Students who attend the seminars will have been either self-selected or selected by the school for their interest in science and mathematics. The Field Representative will present the introductory remarks, mention the major points, and then introduce you. Your presentation to a seminar group can cover the same material as your large group presentation. However, the meeting will be much less formal and students will be encouraged to express their opinions and to ask questions. Since each of these students will attend only one meeting you need not be concerned about repeating a demonstration or remarks you have already

made. In the pilot program we found that the 11th and 12th grade females were more interested than the younger students in exploring ways of combining careers and personal lives, so you may wish to include remarks about these issues. In any case, the students will probably have questions for you. In the event that discussion lags, the Field Representative is prepared to use one of a number of modular activities to spark a discussion.

4. Staff Meeting

Teachers and other staff members will already have received information about the purposes and procedures of the Visiting Women Scientists Program. The purpose of the staff meeting is to encourage teachers and counselors to assist female students in exploring science career opportunities. As part of the program, two Resource Packets containing pamphlets about science careers are being given to the school. The Field Representative will describe the materials in the packet and also discuss other materials such as films which are available. The school will also be asked to have a librarian or counselor talk about the resources the school already has available. (For example, most schools have a copy of the Department of Labor's Occupational Outlook Handbook but very few teachers know of its existence). Though you have no specific responsibilities in the staff meeting, feel free to join in any discussion.

You will certainly want to describe your current job activities and responsibilities at least briefly to each group of students you meet. Additional topics you might discuss are:

1. Your career development -- when you decided upon a science career, who influenced you, who tried to dissuade you, your education, jobs you've held, problems you've encountered and how you've solved them.

2. How you've combined your career with other pursuits (e.g., family, social, community, leisure). If you're married, how does your husband feel about your career? How do you and your husband divide up housekeeping responsibilities? Have you had to decide what to do if one of you is offered a position in another area of the country? If you have children, how are family responsibilities handled?

3. A typical day. Several women scientists in the pilot program kept a brief diary of their activities both on and off the job for an entire day and then discussed it with the students. This proved to be a very effective device for showing the students that women scientists are "real people" too.

Your remarks should be presented conversationally, should generally include some anecdotal information, and should include some humor with which the students can relate. We hope that you are enthusiastic about your work and that you will be able to communicate your enthusiasm to the students. However, please be careful not to appear to be recruiting for your particular field or employer. Similarly, do not give students the

impression that you advocate any one life style (such as not working while your children are very young, having a full-time housekeeper, or having both the husband and wife employed half-time); the point of the program is that a diversity of life styles can be combined with careers in science and technology. Some women scientists in the pilot program kept a balance by presenting examples of how women colleagues handled similar situations differently.

It is possible that some students will interpret this program as "Women's Lib" or "pro-ERA." Please avoid letting them draw you into a debate about these issues, regardless of your personal beliefs. Also, please be careful not to depict yourself or other women scientists as "superwomen." Students will find it hard to identify with a woman who is an award-winning scientist and at the same time sews all of the clothes her family wears and cooks candlelit dinners for 20 people on a weekly basis. They might easily become discouraged from pursuing a science career because such feats are clearly beyond them.

In summary, we would like you to keep things in perspective--science careers can be exciting and rewarding, and these careers can be combined with complete and satisfying personal lives, but there will be problems that will need to be worked out.

To help you prepare for the visits, we are enclosing several materials:

1. The brochure "Careers in Science and Technology: More Women Needed" which will be distributed to students during the visits.

2. The pamphlet Women in Science and Technology which deals with many of the topics important to this program.

3. A copy of the List of Resource Materials (a set of materials about science careers which is being given to each school).

4. A booklet of modular activities which were developed for the Visiting Women Scientists Program; the Field Representative will use these activities as appropriate during the visits.

Now for a few housekeeping matters:

- Please bill us for one day's preparation time in addition to the days you spend visiting the schools; the consulting rate for visitors is $100/day.

- Reasonable expenses for meals will be reimbursed; reimbursement for travel in your own car is at a rate of $.17/mile.

- We are enclosing a "Record of Visit" form and a postage-paid envelope. Please return your invoice and the completed Record of Visit Form to us in this envelope after you have completed your visits.

6

The RTI Field Representative in your area, [Field Rep's name], will contact you soon to discuss plans for the visits or you can call her at [Field Rep's phone number]. If you have difficulty in reaching the Field Representative or if you have any questions or concerns you wish to discuss with me, please call me (collect 919-541-6318).

We appreciate your willingness to serve as a role model for young women and hope the experiences of the Visiting Women Scientists Program will be rewarding to both you and the students.

Sincerely,

Carol Place, Project Director
Visiting Women Scientists Program

CP:cr
Enclosures

O.M.B. No. 099-S-77014
Approval Expires 5/31/82

VISITING WOMEN SCIENTISTS PROGRAM APPLICATION FORM

Name (include Dr., Ms., etc.): _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Telephone: Area Code: _____ Number: _____ Extension: _____

Business Title: _____

Name of Employer: _____

1. Please classify yourself into one of the following broad areas of "science."

(Circle only one.)

Biological Science	1
Physical Science	2
Engineering	3
Mathematics	4
Social Science	5

2. What is your specific field of science (e.g., bacteriology, mechanical engineering, biophysics, etc.)?

Specific Science Field: _____

3. Please list the degrees you have obtained, the year of award, and your major field for each.

	Degree	Year	Major Field
a.			
b.			
c.			

4. Which of the following best describes your present employment?

(Circle only one.)

Academic	1
Non-Profit Organization	2
Profit-Making Organization	3
Government	4
Unemployed	5

5. How do you describe yourself?

(Circle only one.)

American Indian	1
Black, Afro-American or Negro	2
Mexican American or Chicana	3
Puerto Rican	4
Other Latin-American Origin	5
Oriental or Asian American	6
White or Caucasian	7
Other	8

6. Are you interested in being included in the "Women Scientists Roster" to be released to schools and other organizations which wish to conduct programs of this nature? (Your response will in no way affect your eligibility to visit high schools for the 1978-79 Visiting Women Scientists Program.)

(Circle one.)

Yes	1
No	2

Please attach a copy of your résumé if you have one available.

O.M.B. No. 99-R0310
Approval Expires 5/31/82

VISITING WOMEN SCIENTISTS PROGRAM
WOMAN SCIENTIST RECORD OF VISITS

Name: _____

School(s) Visited: 1. _____
2. _____
3. _____

1. Approximately how much time did you spend in preparation for the visits?

_____

2. It is important to the success of this program that the RTI Field Representative who accompanies the woman scientist be pleasant and courteous and that she does everything possible to ensure that the visits run smoothly. Please rate the Field Representative in each of the following regards, and add any comments which you think will help us.

(Circle one on each line.)

	Excellent	Good	Fair	Poor
a. Preparing you for the visits	1	2	3	4
b. Working with you on the days of the visits	1	2	3	4
c. Interaction with school personnel	1	2	3	4
d. Interaction with students	1	2	3	4
e. Knowledge of various careers	1	2	3	4

Comments

(OVER)

3. Briefly describe your presentations including any demonstration you prepared. If you brought slides, please describe what they portrayed.

4. Do you have any suggestions for improving the Visiting Women Scientists Program? If yes, please specify.

(Circle one.)

Yes 1
No 2

5. If the Visiting Women Scientists Program is continued in the future, would you be interested in participating?

(Circle one.)

Yes 1
No 2

Thank you for participating in the 1978-79 Visiting Women Scientists Program.

Please complete this form and return it to RTI, along with your invoice, in the postage-paid envelope provided as soon after your visits as possible.

APPENDIX F

Informational Brochure

List of Resource Materials

Careers in Science and Technology: More Women Needed

Announcement Poster

Examples of Science Careers (Matching Activity)

Case Study

Thinking About a Career in Science and Technology: A Young Woman's Choice

showed slides of themselves at home with their families and friends, or enjoying their leisure moments in recreational activities. In addition, the women scientists talked to the students about their education, training and personal backgrounds. Many related how they happened to choose a scientific career, and some talked about the problems associated with combining a science career with a personal life, telling how they resolved these problems.

In most schools a meeting will be scheduled with school staff including some or all of the following: guidance counselors; teachers in the areas of science, mathematics and social science; school librarians; and other interested school, or district personnel. There are four purposes for the meeting: (1) to explain the goals and rationale of the Visiting Women Scientists Program and relate what the visitors are doing in the school; (2) to discuss how the school's own career-related resources can be used more effectively by students and teachers; (3) to describe the science career materials which are being given to the school; and (4) to discuss the overall topic of women in science, eliciting any ideas the staff might have as to how the National Science Foundation could assist schools in encouraging more females to continue in science and engineering.

Each school which participates in the program will receive two packets of materials describing careers in various areas of science, mathematics, social science and engineering. Students and school staff members will also be given assistance in obtaining additional resources including pamphlets, films, games, and bibliographies for further study.

THE NATIONAL SCIENCE FOUNDATION

VISITING WOMEN SCIENTISTS PROGRAM

Conducted by the

Center for Educational Research and Evaluation
Research Triangle Institute
Research Triangle Park, North Carolina

THE VISITING WOMEN SCIENTISTS PROGRAM

The Visiting Women Scientists Program is an attempt to increase the participation of women in careers in science and technology by: (1) giving female students an opportunity to see and interact with women scientists; (2) providing information about career opportunities in science and technology and about the preparation needed for such careers; and (3) presenting examples of ways in which women scientists are successfully combining science careers and personal lives.

In 1978 the National Science Foundation supported a pilot Visiting Women Scientists Program to encourage high school females to pursue careers in science, including biological science, physical science, mathematics, social science and engineering. As part of the pilot program, women scientists visited 110 high schools across the country. The pilot program was very well received by high school students and staff, and evaluation results indicate that it was successful in encouraging females to seek further information about careers in science.

Because of the success of the pilot program, a similar program will be conducted in the 1978-79 school year by the Research Triangle Institute (RTI). Visits will be conducted in several North Carolina schools during October and November of 1978; and a total of about 135 schools in three other areas of the United States will be visited January through May of 1979.

Typically, an RTI field representative and a woman scientist from the local area will spend one day in each school. In addition to making presentations to large groups of ninth and tenth grade female students, the women scientists will conduct

seminars for eleventh and twelfth grade female students who have already shown an interest in science, and they will meet with teachers, counselors and administrators on an individual or small group basis.

The major purposes of the large group meetings are (1) to provide students with an opportunity to meet a woman scientist role model, and (2) to raise their consciousness level while they can still easily redirect their high school programs to include more mathematics and science. The major purposes of the seminars are (1) to reinforce the notions that women can be interested and successful in science careers and that they can combine these careers with full private lives, and (2) to provide specific information in response to the students' questions. Generally, a few major points are stressed: more women are entering the traditionally male fields of science and engineering; because of new attitudes and federal laws there are many opportunities for women in science; one does not have to be a genius to succeed in a career in science or engineering, but high school females should definitely take electives in science and mathematics in order to have the option of entering these careers later.

As part of their presentations, the women scientists will describe aspects of their careers and their personal lives. During the pilot program, many women scientists prepared demonstrations related to their jobs. For example, one woman scientist brought an actual cross section of a cylinder head from an aircraft engine in order to describe her research on fuel injectors. Some women scientists brought slides or pictures related to jobs, including state population and migration patterns, cultural anthropologists at work, and physiological slides of different animals; others

1978-79 VISITING WOMEN SCIENTISTS PROGRAM
LIST OF RESOURCE MATERIALS

A. MATERIALS INCLUDED IN THE VISITING WOMEN SCIENTISTS PROGRAM RESOURCE PACKET (Please Note: Prices may have changed since the printing of this list. Many of the organizations listing a price for their publications will provide one copy free of charge. In addition, many organizations offer discounts for quantity purchases.)

1. GENERAL

$6.00/50 copies a. *College Times: Facts for Your Future from the College Board* - College Board Publications, Box 2815, Princeton, NJ 08541

$2.00 each b. *Science and Engineering Careers--A Bibliography* - Scientific Manpower Commission, 1776 Massachusetts Avenue, NW, Washington, DC 20036

$1.50 each c. *Women in Science and Technology* - ACT Publications, P. O. Box 168 Iowa City, IA 52240

$2.00 each d. *I'm Madly in Love with Electricity* - Lawrence Hall of Science, University of California, Berkeley, CA 94720, ATTN: Careers

Free e. *Science and Your Career* - U.S. Department of Labor, Bureau of Labor Statistics, 1515 Broadway, Suite 3400, New York, NY 10036

2. ENGINEERING

Free a. *Engineering--A Career of Dedication and Responsibility* - National Society of Professional Engineers, 2029 K Street, NW, Washington, DC 20006

$ .25 each b. *WOMENGINEER* - Engineers Council for Professional Development, 345 East 47th Street, New York, NY 10017

$5.00/hundred c. Several short pamphlets describing areas of engineering such as civil engineering, mechanical engineering, automotive engineering, etc. - Engineers Council for Professional Development, 345 East 47th Street, New York, NY 10017

Free d. *A Career in Metallurgy, Metallurgical Engineering, ...* - The Metallurgical Society of AIME, 345 East 47th Street, New York, NY 10017

Free e. *Women in Engineering at Kodak* - Corporate Information Department, Eastman Kodak Company, Rochester, NY 14650

$ .25 each f. *Did You Ever Wish You Could Change the World?* - American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MI 49085

3. PHYSICAL SCIENCES

$ .50 each a. *Women in Physics* - American Physical Society, Committee on the Status of Women in Physics, 335 East 45th Street, New York, NY 10017

$ .20 each b. *Careers in Chemistry Today* - American Chemical Society, Department of Educational Activities, 1155 Sixteenth Street, NW, Washington, DC 20036

$ .20 each c. *Careers in Chemistry--Opportunities for Minorities* - American Chemical Society, Department of Educational Activities, 1155 Sixteenth Street, NW, Washington, DC 20036

$ .25 each d. *Careers in Exploration Geophysics* - Society of Exploration Geophysicists, P. O. Box 3098, Tulsa, OK 74101

Free e. *Your Tomorrow--A Guide to Careers in the Chemical Industry* - Manufacturing Chemists Association, 1825 Connecticut Avenue, NW, Washington, DC 20009

A. MATERIALS (continued)

Free — f. *Minority Engineers in the Chemical Industry* - Manufacturing Chemists Association, 1825 Connecticut Avenue, NW, Washington, DC 20009

Free — g. *The Challenge of Meteorology* - American Meteorological Society, 45 Beacon Street, Boston, MA 02108

$ .25 each — h. *A Career in Astronomy* - The Executive Officer, American Astronomical Society, 211 FitzRandolph Road, Princeton, NJ 08540

4. BIOLOGICAL SCIENCES

$ .20 each — a. *Careers in Biology* - Education Department, American Institute of Biological Sciences, 1401 Wilson Boulevard, Arlington, VA 22209

$ .25 each — b. *Microbiology in Your Future* - American Society for Microbiology, 1913 I Street, NW, Washington, DC 20006

Free — c. *Ecology and Your Career* - U. S. Department of Labor, Bureau of Labor Statistics, 1515 Broadway, Suite 3400, New York, NY 10036

5. MATHEMATICS

Free — a. *Math and Your Career* - U. S. Department of Labor, Bureau of Labor Statistics, 1515 Broadway, Suite 3400, New York, NY 10036

$ .05 each — b. *The Math in High School ... You'll Need for College* - Mathematical Association of America, 1225 Connecticut Avenue, NY, Washington, DC 20036

Free — c. *Careers in Statistics* - Committee of Presidents of Statistical Societies, c/o American Statistical Association, 806 15th Street, NW, Washington, DC 20005

6. SOCIAL SCIENCES

$ .50 each — a. *Careers in Geography* - Association of American Geographers, 1710 Sixteenth Street, NW, Washington, DC 20009

$ .60 each — b. *Careers in Psychology* - American Psychological Association, 1200 17th Street, NW, Washington, DC 20036

$ .60 each — c. *Careers and the Study of Political Science* (Curzan) - American Political Science Association, 1527 New Hampshire Avenue, Washington, DC 20036

Free — d. *What is Anthropology* - American Anthropological Association, 1703 New Hampshire Avenue, NW, Washington, DC 20009

7. FINANCIAL AID

Free — a. *A selected list of major fellowship opportunities and aids....* - Fellowship Office, Commission on Human Resources, National Research Council, 2101 Constitution Avenue, Washington, DC 20418

$1.00 each — b. *Educational Financial Aids* - American Association of University Women, 2401 Virginia Avenue, NW, Washington, DC 20037

$1.50 each — c. *Don't Miss Out: The Ambitious Student's Guide to Scholarships and Loans* - Octameron Associates, P. O. Box 3437, Alexandria, VA 22302

$1.50 each — d. *The As & Bs of Merit Scholarships* - Octameron Associates, P. O. Box 3437, Alexandria, VA 22302

Free — e. *Financial Aid: A Partial List of Resources for Women* - Project on the Status and Education of Women, Association of American Colleges, 1818 R Street, NW, Washington, DC 20009

B. ANNOTATED BIBLIOGRAPHY OF ADDITIONAL MATERIALS

1. CAREER PUBLICATIONS

a. *Occupational Outlook Handbook*, 1978-79 - U.S. Department of Labor, Bureau of Labor Statistics, U.S. Government Printing Office, Washington, DC 20402 ($7.00) -

General reference book providing descriptions of about 850 occupations including: the nature of the work; places of employment; qualifications needed; earnings and working conditions; and sources of additional information.

b. *I Can Be Anything--Careers and Colleges for Young Women*, 1978 (Mitchell) - College Entrance Examination Board, Princeton, NJ 08540 ($7.95 paperback, $12.95 hardcover) -

Describes careers for young women--and certainly all careers are for women. Goes beyond a description of career information and introduces the critical consideration for girls and women: the consideration of life style.

c. *New Career Options for Women--A Counselor's Sourcebook*, 1977 - ($16.95), Human Sciences Press, New York, NY 10011 *New Career Options--A Woman's Guide*, 1977 ($4.95); *New Career Options for Women--A Selected Annotated Bibliography*, 1977 ($9.95) (Set of all three publications approximately $26.00) -

Excellent set of source books dealing with careers for women. Reviews employment opportunities, legislation, practical advice regarding family and work, and suggestions for career and educational planning.

d. *Careers for Women in the 70's*, 1973 - Women's Bureau, Department of Labor, U.S. Government Printing Office, Washington, DC 20402 ($.50) -

Expected numbers of openings in particular fields are presented as well as the employment picture for women. The suggestion is made that women's careers should not be any different from men's.

e. *U.S. Working Women - A Chartbook*, 1975 - U.S. Department of Labor, Bureau of Statistics, U.S. Government Printing Office, Washington, DC 20402 ($1.75) -

Through charts and graphs, a wide range of data are presented on the characteristics of American working women and their changing status over the last quarter of a century.

f. *Supply and Demand for Scientists and Engineers*, 1977 (Vetter) - Scientific Manpower Commission, Washington, DC 20036 ($1.50) -

An excellent review of studies including projections of the supply and demand for scientists and engineers.

B. ANNOTATED BIBLIOGRAPHY (continued)

g. *Women and Minorities in Science and Engineering,* 1977 - National Science Foundation, U.S. Government Printing Office, Washington, DC 20402 ($.75) -

Analytical report developed from existing statistical data to illuminate the role of women and minorities in science and engineering.

h. *Federal Career Directory,* 1976-77 - U.S. Civil Service Commission, U.S. Government Printing Office, Washington, DC 20402 ($3.45) -

Describes federal careers, employers and job briefs.

i. *What Can I Be? A Guide to 525 Liberal Arts and Business Careers* (Leo Lieberman, $6.75), Martin M. Bruce, Ph.D. Publishers, Box 228, New Rochelle, NY 10804 -

Presents the required and desirable academic majors, abilities and educational degrees for students who know the career they want; provides suggested majors and careers based on school subjects enjoyed in the past, for students who have not yet decided on a career or occupation.

j. *Career Opportunities Boxes,* 1978 - Time Share, Houghton Mifflin, 630 Oakwood Avenue, West Hartford, CT 06110 ($54.00 each) -

Job information associated with major disciplines. Occupations covered include a wide range of skill levels and educational requirements.

k. *Science Career Exploration for Women,* 1978 - National Science Teachers Association, 1742 Connecticut Avenue, NW, Washington, DC 20009 ($2.50) -

This book, based in part on the NSF-funded Career Exploration Project, is aimed at science teachers, counselors, and others who work with young women of high school and college age. The purpose of the book is to provide tools that can be used to help young talented women students explore careers, especially science-related professional careers.

l. *Keys to Careers in Science and Technology,* 1973 - National Science Teachers Association, Washington, DC 20036 ($1.00) -

Comprehensive bibliography of career guidance publications and information on scholarships and loans, special programs for students and teachers, awards, and agencies.

B. ANNOTATED BIBLIOGRAPHY (continued)

m. *Engineering as a Profession for Women,* 1976 - Engineering Manpower Bulletin #29, Engineering Manpower Commission, New York, NY 10017 ($2.00) -

Discusses misconceptions, current employment picture, barriers, and problems faced by women in engineering, and also talks about why engineering needs women.

n. *Women and Success--The Anatomy of Achievement,* Kundsin (Ed.) -

Profiles of women in careers in crystallography, mathematics, electrical engineering, physics, meteorology, chemistry, etc.

o. *Test Yourself for Science,* 1971 - Scientific Manpower Commission, Washington, DC 20036 (single copy $1.00; 25+ $.50 ea.) -

For students. This booklets contains puzzles and problems to think about and try to solve: also included is a section which suggests how to get more information about careers in science.

p. *When I Grow Up I'm Going to be Married* - Commission on the Status of Women, Sacramento, CA 95884 -

A game which illustrates how time and circumstance affect women.

q. *Job Family Series (e.g., "Jobs in Engineering" and "Jobs in Science")* - Science Research Associates, Inc., 155 North Wacher Drive, Chicago, IL 60606 -

Each of the booklets contains informative descriptions of job situations based on observation and worker interviews. (Booklets $2.55 each, cassettes $10.75 each)

r. *Planning for Career Options* - CATALYST, 14 East 60th Street, New York, NY 10022 (approx. $1.95) -

This is a self-guidance booklet prepared for women to help them develop realistic career goals.

2. FINANCIAL AID

a. *Catalog of Federal Education Assistance Programs,* 1976 - U.S. Government Printing Office, Washington, DC 20402 ($7.30)

b. *Federal and State Student Aid Programs,* 1972 - U.S. Government Printing Office, Washington, DC 20402 ($1.10)

c. *Financing Postsecondary Education in the United States,* 1974 - U.S. Government Printing Office, Washington, DC 20402 ($4.00)

B. ANNOTATED BIBLIOGRAPHY (continued)

d. *Guaranteed Student Loan Program*, 1976 - U.S. Government Printing Office, Washington, DC 20402 ($3.40)

e. *Financial Aid for College Students* - American Chemical Society, Department of Educational Activities, 1155 Sixteenth Street, NW, Washington, DC 20036 ($.05)

3. FILMS

a. "Keep the Door Open..." - (18 minutes, color). Review copy sent upon request.

Sandia Laboratories
Box 5800
Albuquerque, NM 87115

An excellent discussion by 13 professional women of the problems involved in combining careers with marriage and a family, stereotypes and obstacles to be overcome, along with the joys experienced in a career. Women portrayed represent such areas as chemistry, law, zoology, engineering, math and biology.

b. "The Women's Prejudice Film" - ($255.00 - 18 minutes, color). Review copy sent upon request.

Sandler Institutional Films, Inc.
1001 N. Poinsettia Place
Hollywood, CA 90046

Specific prejudices and stereotypes are voiced by both men and women. Included are short profiles of women in traditionally male careers. The film states that women must overcome their own self doubts and worries as well as wade through male chauvinism. While this film is not specific to science, it is a particularly good consciousness-raising device for females who have not considered problems of discrimination against working women.

c. "Women's Work: Engineering" - ($295.00 purchase or $30.00 5-day rental, 26 minutes, 16mm film or color videotape) -

MIT
Center for Advanced Engineering Study
77 Massachusetts Avenue
Cambridge, MA 02139

Explores the experience of being an engineer and a woman--through the professional and personal lives of students and working engineers.

- What it is like to work at that job
- The amount of education needed
- The number of women in the field and where they work
- Salaries
- The future for women in the job
- Which colleges award the most degrees to women in the field
- Where more information can be obtained

3. Pamphlets published by professional organizations such as the American Chemical Society, the Society of Women Engineers, and many others. Schools which participated in the Visiting Women Scientists Program received resource packets containing pamphlets about financial aid and career opportunities in areas of science and engineering.

4. Your school counselors. Depending upon the organization of your school, there may be guidance counselors, career counselors, or both available to you. Part of their job will be to assist individual students in thinking about future careers and how to prepare for them. The counselors have been trained to help you in thinking about careers, and they have many materials available to assist you.

Prepared by the Center for Educational Research and Evaluation, Research Triangle Institute, as part of the National Science Foundation's Visiting Women Scientists Program

HELP WANTED

BIOLOGIST/CHEMIST

Ph.D. in biological or chemical discipline with 1-2 yrs. previous supervisory experience. Administer to an organization of 50 permanent scientists & technicians who work in such diverse areas as Asbestos research, inhalation toxicology, tissue culture and cytotoxicity, mutagenesis, pesticide chemistry, carcinogen metabolism and analytical biochemistry. Coordinate activities of personnel & assure that scientists receive all necessary resources to complete the scope of work, prepare budgets and performance reviews, prepare monthly progress reports, provide communication liaison between upper management and technical personnel. Will initiate and provide coordination for program expansion and devel

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below:

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systems
- Hardware a
- Comparative
architecture
- Large syste

DATA BAS
- Data base m
- Implementat
IDMS, DRS
- Performance
media, distributed data design, network design

DBM SYSTEMS LIAISON SPECIALIST
- Familiarity with programming and data base terminology
- Experience with technical reports on intelligence or multi-vendor computer systems
- Experience with vendor technical library requirements

PROGRAMMER

Real-time World-wide Earthquake & Underground Explosion Detection System in Support of Comprehensive Test Ban Treaty Research. System includes DEC & IBM hardware. Opportunities in interactive graphics network processing system improvement, & creation & management of a large seismic data-base. Math, Science or Computer Science degree required.

SYSTEMS ANALYST/ PROGRAMMER

Join our staff of R&D Engineers & Scientists, refining existing math models & engineering management information systems. Prefer applied mathematics background with experience in cost analysis. Require FORTRAN IV experience, & prefer prior experience with CDC 6000. Salary open.

HELP WANTED

ECONOMIST

Large trade association is seeking research-oriented economist with minimum 1 to 3 years experience in banking and/or financial data analysis.

Successful candidate will have degree(s) in Economics or related fields and possess good verbal and writing skills. Should have ability to communicate well with non-economists. Familiarity with consumer credit or housing policy issues would be helpful.

Starting salary commensurate with experience.

ELECTRICAL/ELECTRONIC & MECHANICAL

t specialized
tronic and/or
also involve
n the produc-
include laser
mputers, and
dination with
and quality
ignments. BS
r Mechanical

mmed, open-
e in hydrology
Positions will
mplete fringe
ling salaries

rement & in-
al engineers &
MS degrees in
ired. Strong
ired.

MECHANICAL METALLURGICAL
ELECTRICAL CHEMICAL

Development and expansion of our state-of-the-art radiological waste handling systems has created opportunities for experienced engineers. Our position of leadership in radiological waste handling development provides outstanding growth and development in the areas of:

Chemical process control systems design; fluid andgas process system equipment specification development; design and selection of chemical, slurry and solid processing, air scrubbing and remote handling systems; and material considerations for high temperature applications.

Engineers with experience in these areas who desire immediate challenge and opportunity to demonstrate professional ability are invited to submit their resumes.

CIVIL ENGINEER
Position in County Gov't.

Acts as a project engineer for capital projects such as roads and storm drainage; reviews subdivision and water and sewer plans for conformance with codes and standards and prepares technical reports and evaluation. Position requires a bachelor's degree in civil engineering and two years of engineering experience.

CAREERS IN SCIENCE AND TECHNOLOGY: MORE WOMEN NEEDED

Chemist

Petroleum Engineer

Geologist

An Increasing Number of Women Will Work

Over the past decade, a greater percentage of women have been employed outside their homes. The Women's Bureau of the U.S. Department of Labor reports that 9 out of 10 women will work at some time in their lives. Even with a break in employment for marriage and children, the average woman can expect to work 25 years. And it is not just single women, widows, and divorcees who are working; the majority of working women are married women living with their husbands and families.

Expanding Job Opportunities for Women

In the past, many women were unaware that they would probably work for a number of years, and they did not adequately prepare themselves for a career. When they later decided to seek employment, they were often forced to accept low-paying and unrewarding positions even though they were capable of succeeding in other jobs. Even professional women have tended to choose the few fields traditionally open to women, such as teaching, nursing, and social work; relatively few have chosen occupations in science and technology.

However, times are changing. During the past 10-20 years, an increasing number of women have been employed in occupations which were once considered the exclusive domain of males. For example, in the 6 years from 1968 to 1974 the proportion of women in the science labor force increased from 8 percent to 14 percent, and it seems that more women than ever are planning to enter traditionally male careers. For example, while only 7 percent of American physicians are women, 17 percent of the physicians in training are women.

It has become quite evident that women can successfully perform jobs which have traditionally been carried out by men. In addition, recent federal laws make it illegal for an organization to discriminate on the basis of sex. Many schools and companies now have affirmative action plans and are actively recruiting women for positions traditionally filled by men.

Opportunities for Women in the Sciences

Careers in science, engineering, and technology are included among those careers that are becoming available to qualified women at an ever-increasing rate. Employers are actively seeking qualified women for positions in these fields, but there is a scarcity of women trained for many of these areas.

Scientists are employed in industry, government, colleges and universities, research laboratories, consulting firms, etc. Many employers are seeking women trained in the various science fields (including mathematics, engineering, biological science, physical science, and social science). In general, opportunities for persons trained in the sciences are much better in industry than in academia. Also, fields which already have a considerable number of women are generally less eager than others to train and employ additional women.

Engineering is a particularly promising field for women. Examples of the activities of engineers include developing scientific equipment, designing and supervising construction, and generally planning and implementing technical solutions to modern day problems. Women are needed in every area of engineering—aerospace, agricultural, chemical, civil, electrical, industrial, mechanical, metallurgical, mining, and others. Currently, only

about two percent of all engineers are women, and employers are actively seeking more. According to Daniel Drucker, Dean of the College of Engineering at the University of Illinois, "Large corporations and small are just about knocking each other down in their eagerness to find qualified women engineers." Many engineering jobs are available to persons with a bachelor's degree, and salaries are excellent.

Keeping Your Options Open for a Career in Science and Technology

A woman does not have to be a genius to pursue a successful science career. You might want to consider a career in one of the many science-related fields if you:

- are curious about why and how events occur;
- like to see how things work;
- like challenges; and
- take pride in performing tasks well.

As one scientist said, "Gender doesn't matter. A scientist or technologist can be 100% feminine and do the job well."

While you do not have to be the brightest student in your class, you do need to have a good background in science and mathematics to qualify for many of these jobs. In the past, many young women who have been fully capable of obtaining a solid background in science and mathematics have failed to do so because they did not think seriously about a career or because they thought science careers were reserved for men. In some cases their inadequate science and mathematics backgrounds cost them a chance at an interesting, worthwhile career; in other cases they were forced to spend valuable time and money catching up on basic mathematics and science skills. Keep your options open by getting a good background in mathematics and science, especially mathematics, while you are in high school, even if you do not think you will want to pursue a science-related career. Don't limit yourself later by failing to get adequate high school preparation.

Obtaining Additional Information About Careers

While you may already have a pretty good idea about your interests and abilities, you probably need to know about various occupations before you can decide about possible careers. Some resources you might want to use include:

1. *The Occupational Outlook Handbook*. This "encyclopedia of careers," published by the U.S. Department of Labor, is available in most high schools and public libraries. The handbook contains information about more than 800 occupations, including what the work is like; places of employment; training, qualifications and advancement; job prospects; salaries and working conditions; and sources of additional information.
2. *I Can be Anything: Careers and Colleges for Young Women*. Joyce Slayton Mitchell. College Entrance Examination Board, Princeton, New Jersey, 1978.

   In addition to describing a large number of careers, this book encourages women to consider the concept of life style as they think about career alternatives. The author includes examples of working women in various careers and discusses the future for women in those careers. For each occupation this book discusses the following:

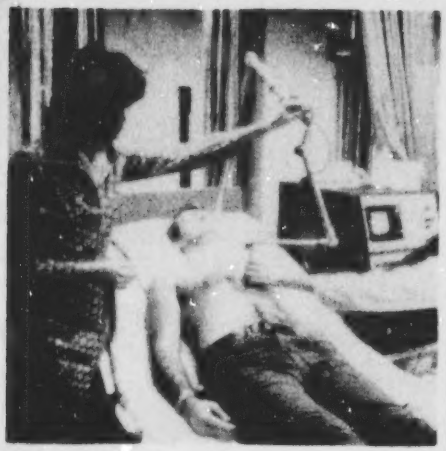
Our school is participating in the

NATIONAL SCIENCE FOUNDATION

VISITING WOMEN SCIENTISTS PROGRAM

Two women scientists will visit us to discuss careers in mathematics, science and engineering.

Date:



Bio-Physicist

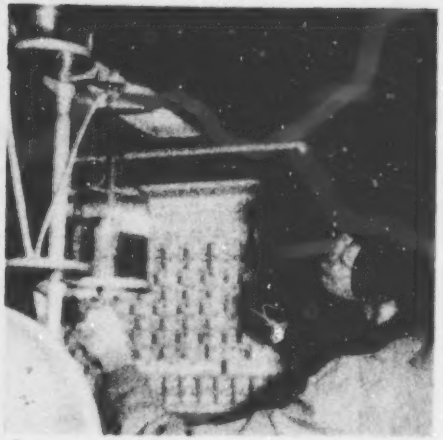
Petroleum Engineer

Geologist

Physicist

Electrical Engineer

Organic Chemist



NATIONAL SCIENCE FOUNDATION
1979 VISITING WOMEN SCIENTISTS PROGRAM

Examples of Science Careers

Prepared by

Center for Educational Research and Evaluation
Research Triangle Institute
Research Triangle Park, North Carolina 27709

JOB TITLES

I. Engineering

A. Aeronautical
B. Civil
C. Electrical
D. Mechanical
E. Petroleum

II. Physical Sciences and Mathematics

F. Chemist
G. Computer Programmer
H. Meteorologist
I. Physicist
J. Statistician

III. Life Sciences

K. Botanist
L. Geneticist
M. Microbiologist
N. Oceanographer
O. Physiologist

IV. Social Sciences

P. Anthropologist
Q. Economist
R. Political Scientist
S. Industrial Psychol[illegible]

V. Interdisciplinary

T. Biochemist
U. Food Scientist
V. Psychophysiologist

EXAMPLES OF SCIENCE CAREERS

INSTRUCTIONS: Below you will find an example of the many different tasks associated with a particular job. Match the example with the titles of people who may perform these tasks in science and technology careers.

I. Engineering

_____1. Designs, tests and supervises the manufacture of communications equipment (telephone, telegraph etc.)

_____2. Involved in the drilling for and production of oil

_____3. Works in the development of clean, quiet jet engines

_____4. Responsible for the design and production of efficient internal combustion engines

_____5. Designs and supervises construction of buildings in high risk areas to ensure that they meet earthquake safety standards

II. Physical Sciences and Mathematics

_____1. Analyzes and uses numerical data such as that gathered for a population census

_____2. Studies current weather patterns in order to make predictions about future conditions

_____3. Develops new compounds such as rocket fuel, detergents or cosmetics

_____4. Writes detailed instructions for a machine to follow in order to solve a problem

_____5. Develops mathematical models of physical phenomenon such as gravity

III. Life Sciences

_____1. Determines the effect of pollution on marine life

_____2. Studies the inheritance traits such as eye color from one generation to another

_____3. Studies the effects of a new fertilizer on plant life

_____4. Investigates how the human body reacts to space travel

_____5. Isolates and analyzes bacteria that causes disease

IV. Social Sciences

_____1. Advises large corporations on matters of regional supply and demand for their product

_____2. Tests job applicants to determine if they fit the personnel needs of a large company

_____3. Lives with a group of people to observe and write about their social customs, beliefs and material possessions

_____4. Studies and writes about the structure of governments in developing nations

V. Interdisciplinary

_____1. Studies how the imbalance of hormones in humans can affect behavior

_____2. Deals with the proteins and other compounds involved in the processes of living things.

_____3. Conducts tests to assure safe and sanitary processing of canned goods

CASE STUDY

Sally Wilson is a junior in high school. She has always liked school and made good grades. She is especially proud of an award she won for her chemistry project in the science fair and she would like to go to college to become a chemist. Her younger brother, Bob, with whom Sally has a close relationship, is in the 10th grade. He lovee to work with motors, does well in math and science courses and is considering an engineering career.

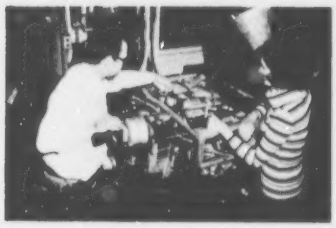
Mr. and Mrs. Wilson have decided Bob should go to college. They have begun to talk to him about possible engineering schools, and have encouraged him to discuss his plans with the school counselor. No one has talked to Sally about college, and she is beginning to feel left out. The Wilsons are not rich--they haven't enough money to send both Bob and Sally to college. Sally knows that if she is to have a chance to enter college, she should begin to plan right away.

What do you think should happen?

What should Sally do?

THINKING ABOUT A CAREER IN SCIENCE AND TECHNOLOGY

A YOUNG WOMAN'S CHOICE



Prepared by the
Center for Educational Research and Evaluation
Research Triangle Institute
as part of the
National Science Foundation's
Visiting Women Scientists Program

Thinking About A Career

Most young women will work for a number of years and there are many new, exciting job opportunities available to those who qualify. Each young woman today should consider the likelihood that she can succeed at a variety of careers, including those in science and technology.

It is not important for you as a high school student to choose a specific career and prepare only for that career. You should, however, spend some time thinking about possible careers, and relating them to your personal interests, abilities and ambitions. This will provide you an opportunity to consider rewarding careers and plan a high school and college program which will prepare you for a job that satisfies your goals and interests.

If you haven't begun to think about career alternatives or study materials related to careers in science and technology, here are some resources you might want to use.

Visiting Women Scientists Program Resource Packet

Packets of resource materials were prepared specifically for this program, and they are available in your school. They contain pamphlets about financial aid and career opportunities in the areas of science, mathematics, social science and engineering. They also include a listing of many other career publications and where you can obtain them.

What Steps Can You Take To Plan A Successful Career?

On the back page of this pamphlet is a list of steps you can take in thinking about a career. This was reprinted from a booklet in the resource packet; and it might help you begin to plan for a career. Remember that no matter what resources you use in career planning, the most important one is you. Only you can relate your interests and abilities to decisions about a future career.

I Can Be Anything

Joyce Slayton Mitchell is the author of *I Can Be Anything: Careers and Colleges for Young Women*, published in 1978 by the College Entrance Examination Board in Princeton, New Jersey.

In addition to describing a large number of careers, this book encourages women to consider the concept of life style as they think about career alternatives. The author includes examples of working women in various careers and discusses the future for women in those careers.

For each occupation this book discusses the following: What it is like to work at that job; what education will be needed; how many women are in the field and where they work; what the salaries are; the future for women in the job; what colleges award the most degrees to women in the field; and where more information can be obtained.

The Occupational Outlook Handbook

This "encyclopedia of careers" is published by the U.S. Department of Labor, Bureau of Labor Statistics. It is available in most school and public libraries.

The handbook includes information about 850 jobs and more than 30 major industries. In the table of contents, most science, mathematics, and engineering occupations are listed under "Science and Technical Occupations;" there is also a section on "social scientists." The following examples show just a small sample of the information you can obtain in the *Occupational Outlook Handbook*.

Nature of the Work

- Civil engineers design and supervise the construction of roads, bridges, airports, and buildings.
- Computer systems analysts plan efficient methods of processing data.

Places of Employment

- Most anthropologists, geographers, and political scientists work in colleges and universities while most statisticians and economists work in private industry or research organizations.
- Four of 10 oceanographers work in just 3 states—California, Maryland and Virginia.

Training, Qualifications and Advancement

- A bachelor's degree in engineering is the usual requirement for a beginning engineering job.
- A doctoral degree is almost always required for a job as an astronomer or a psychologist.

Job Prospects Through the Mid-1980's

- Engineers will be particularly needed in energy-related activities such as designing energy-saving systems for automobiles and homes.
- The outlook for graduates of computer-related curriculums should be excellent.
- The number of persons who will graduate with advanced degrees in sociology is likely to exceed available job openings.

Salary and Working Conditions

- Biologists with a bachelor's degree and no experience had an average starting salary of $10,200 in private industry in 1976, while the average starting salary for engineering graduates was $14,800 a year.
- Many engineers work indoors in offices and research laboratories, but others spend a lot of time in factories, mines,

construction sites, or other outdoor locations.

Sources of Additional Information

- Lists of schools offering education in forestry are available from the Society of American Forestors, 5400 Grosvenor Lane, Washington, D.C. 20014
- Information on career opportunities and earnings for chemists is available from the American Chemical Society, 1155 16th Street, NW, Washington, D.C. 20036

School Counselors

Depending upon the organization of your school, there may be guidance counselors, career counselors, or both available to you. Part of their job is to assist individual students in thinking about future careers and how to prepare for them. The counselors have been trained to help you in thinking about careers, and they have many materials available which can help you.

School counselors are often very busy people with many different jobs and responsibilities. It is possible that they will not have the time to take the initiative to work with each student in discussing a career. However, if you wish to discuss your career alternatives with your counselor and take the initiative to make an appointment, it is very likely that he or she will assist you with personal discussion and useful materials available in your school or public library.

Steps You Can Take To Plan A Successful Career*

Take yourself seriously and decide to plan responsibly for your own future.

Think about how you want your career to fit into the life you want. As you do, try to picture yourself in careers you may not have considered before, as well as in those you have already thought about.

Become an expert on yourself.

Explore your interests and abilities. Ability tests and interest inventory results are one way to begin. See about these at the counseling center of your school or college. If you took the ACT or SAT, check your score report.

Find out about some of the many career opportunities which are open to you.

Don't limit yourself to the outdated lists of "women's careers." Consider all possibilities: Look for up-to-date information about specific careers. Talk to women in science and technology careers. Learn about why they chose careers that in the past were unusual for women. Write to professional associations. Watch for TV shows, speakers, and conferences about these fields, too. You might become interested in a career you have never dreamed of, if

you knew something about it.

Learn what is required to succeed in each of the careers you consider.
Talk to counselors and advisors who are particularly interested in helping young women explore the full range of career possibilities. Ask them to help you find out about the kinds of training and education you will need. Write to colleges for program information.

Begin to prepare early for your career.
Be sure to take courses in high school and college that keep your options open. Enroll in summer science programs offered by colleges and universities, while you are still in high school. These programs can give you some idea of what a career in science is like. Look for part-time jobs, summer employment, or volunteer activities to help you explore the world of work. Career options develop out of experience.

Don't restrict yourself as you begin to make decisions about your career.
Consider *all* the careers that interest you and for which you can qualify. Women today and tomorrow will be leading full lives, engaging in a wide range of careers, enjoying a variety of family life styles, and helping as equal partners in the search for a better world.

Set your own goals and learn how to work for them.
Keep a strong image in your mind of what those goals are. Work toward your goals with the idea of success in your mind. Many women are successful and happy in challenging and interesting careers. You can be too!

Take charge of making decisions for your own life and career.
Assert your own ideas about what is the best career for you, whether it is in science or technology or some other area. You know best what your abilities and interests are. Others can help you explore your options, but don't let anyone else decide for you. Keep your dreams alive and make the best ones come true!

* Reprinted from *Women in Science and Technology: Careers for Today and Tomorrow*, 1976, with slight modification and the permission of the American College Testing Program.

APPENDIX G

Women Scientists Roster Announcement
Women Scientists Roster Form
Women Scientists Roster Formats

WOMEN SCIENTISTS ROSTER

Last year the National Science Foundation supported a pilot Visiting Women Scientists Program in which 40 women scientists visited 110 high schools across the country. Based on the success of the pilot program, a number of schools have requested lists of women scientists who might be willing to meet with their students. Women scientists who wish to be included in a roster to be released to schools should send the following information to Ms. Carol Place, Research Triangle Institute, Box 12194, Research Triangle Park, North Carolina 27709 by January 31, 1979:

(1) name;
(2) mailing address;
(3) telephone number;
(4) type of science (biological, physical, engineering, mathematics, social science);
(5) specific science field (e.g., bacteriology, mechanical engineering);
(6) highest degree earned;
(7) type of employment (academic, non-profit organization, profit-making organization, government);
(8) race or ethnic background.

Respondents should omit any information they do not wish to have released.

O.M.B. No. 099-S-77014
Approval Expires 5/31/82

WOMEN SCIENTISTS ROSTER FORM

1. Name (Include Dr., Ms., etc): _____

2. Address: _____

   City: _____ State: _____ Zip Code: _____

3. Telephone: Area Code: _____ Number: _____ Extension: _____

4. Please classify yourself into one of the following broad areas of "science."

   (Circle only one.)

Biological Science	1
Physical Science	2
Engineering	3
Mathematics	4
Social Science	5

5. What is your specific science field (e.g., bacteriology, anthropology, mechanical engineering, biophysics, etc.)?

   Specific Science Field: _____

6. What is the highest degree you have obtained?

   (Circle only one.)

Bachelor's	1
Master's	2
Doctorate	3

7. Which of the following best describes your present employment?

   (Circle only one.)

Academic	1
Non-Profit Organization	2
Profit-Making Organization	3
Government	4

8. How do you describe yourself?

   (Circle only one.)

American Indian	1
Black, Afro-American or Negro	2
Mexican American or Chicana	3
Puerto Rican	4
Other Latin-American Origin	5
Oriental or Asian American	6
White or Caucasian	7
Other	8

If you wish to be included in the Women Scientists Roster please return this form to RTI by January 31, 1979.

THANK YOU FOR YOUR COOPERATION.

MAILING ADDRESS	PHONE NUMBER AREA OF SCIENCE--SPECIFIC FIELD	HIGHEST DEGREE AND 1978 EMPLOYMENT	RACE OR ETHNIC BACKGROUND
BLACKWELL, MS. ANN LOWES THE UNIVERSITY OF TEXAS AT ARLINGTON RESOURCE SYSTEMS RES. GROUP ARLINGTON TX 76019	(817) 273-2561 ENGINEERING-- SYSTEMS (ECOLOGICAL AND ENVIRONMENTAL RESOURCES	MASTER'S ACADEMIC	WHITE
BODY, MS. EMMY COLORADO SCHOOL OF MINES GEOLOGY DEPARTMENT GOLDEN CO 80401	(303) 279-0300 ENGINEERING-- GEOLOGICAL ENGINEERING	DOCTORATE ACADEMIC	WHITE
BOUTILIER, MS. PHYLLIS MICHIGAN TECHNOLOGICAL UNIVERSITY DEPT. OF MATHEMATICS HOUGHTON MI 49931	(906) 487-2068 MATHEMATICS-- MATHEMATICS WITH ELECT. ENG. UNDERGRADUATE DEG.	MASTER'S ACADEMIC	WHITE
BRANNON, DR. MARY JANE HUNTINGDON COLLEGE BIOLOGY DEPARTMENT MONTGOMERY AL 36106	(205) 265-0511 BIOLOGICAL SCIENCE-- PARASITOLOGY, BACTERIOLOGY	DOCTORATE ACADEMIC	WHITE
BRIMI, MS. MARJORIE 3247 EAST LAKE CALHOUN PKWY. MINNEAPOLIS MN 55408	(612) 870-2534 ENGINEERING-- CHEMICAL ENGINEERING	BACHELOR'S PROFIT-MAKING ORGANIZATION	WHITE
BRINKLEY-CARTER, DR. CHRISTINA COL. OF PHYSICIANS & SURG. OF COLUMBIA U. 60 HAVEN AVENUE NEW YORK NY 10032	(212) 694-6980 SOCIAL SCIENCE-- DEMOGRAPHY	DOCTORATE NON-PROFIT ORGANIZATION	BLACK
BROWN, DR. PATRICIA S. SIENA COLLEGE DIVISION OF SCIENCE LOUDONVILLE NY 12211	(518) 783-2450 ENDOCRINOLOGY/ZOOLOGY	DOCTORATE ACADEMIC	WHITE
BUTERA, MS. M. KRISTINE NASA/EARTH RESOURCES LABORATORY 1010 GAUSE BLVD. SLIDELL LA 70458	(504) 255-6531 BIOLOGICAL SCIENCE-- MARSH BOTANIST/REMOTE SENSING SPECIALIST	MASTER'S GOVERNMENT	WHITE
CARDWELL, DR. BILLIE JO 1121 ELLIS AVENUE LUFKIN TX 75901	(713) 634-5477 SOCIAL SCIENCE-- PSYCHOLOGY	DOCTORATE PROFIT-MAKING ORGANIZATION	WHITE
CHANG, DR. ALICE F. VETERANS ADMINISTRATION HOSPITAL 4801 LINWOOD BOULEVARD KANSAS CITY MO 64128	(816) 861-4700 SOCIAL SCIENCE-- CLINCIAL PSYCHOLOGY (MEDICAL PSYCHOLOGY)	DOCTORATE GOVERNMENT	ASIAN OR PACIFIC ISLANDER
CIGLER, DR. BEVERLY A. THIEL COLLEGE 250 ACADEMIC CENTER GREENVILLE PA 16125	(412) 588-7700 SOCIAL SCIENCE-- POLITICAL SCIENCE	DOCTORATE ACADEMIC	WHITE

ZIP	CITY	NAME	AREA OF SCIENCE	RACE OR ETHNIC BACKGROUND
48109	ANN ARBOR	KOSTYNIUK, DR. LIDIA P.	ENGINEERING	WHITE
49008	KALAMAZOO	MEYER, DR. RUTH A.	MATHEMATICS	WHITE
49931	HOUGHTON	BOUTILIER, MS. PHYLLIS	MATHEMATICS	WHITE
MINNESOTA				
55408	MINNEAPOLIS	BRINI, MS. MARJORIE	ENGINEERING	WHITE
55418	MINNEAPOLIS	BERG, DR. MARIE H.	PHYSICAL SCIENCE	WHITE
55812	DULUTH	FORBES, DR. DONNA J.	BIOLOGICAL SCIENCE	WHITE
56093	WASECA	HOELMER, MS. KATHRYN	BIOLOGICAL SCIENCE	WHITE
MISSISSIPPI				
39701	COLUMBUS	UTTINGER, DR. CAROL B.	MATHEMATICS	WHITE
39762		PRICE, DR. BARBARA	MATHEMATICS	WHITE
MISSOURI				
63135	ST. LOUIS	KIMBROUGH, MS. JEANETTE	SOCIAL SCIENCE	BLACK
63141	ST. LOUIS	MYER, DR. BAYLA	SOCIAL SCIENCE	WHITE
63301	ST. CHARLES	STOLLER, MS. PATRICIA S.	ENGINEERING	WHITE
64110	KANSAS CITY	SMITH, MS. JANICE L.	MATHEMATICS	WHITE
64128	KANSAS CITY	CHANG, DR. ALICE F.	SOCIAL SCIENCE	ASIAN OR PACIFIC ISLANDER
64151	LAKE WAUKOMIS	HALLS, DR. BETTY L.	SOCIAL SCIENCE	WHITE
64468	MARYVILLE	MOORE, DR. DOROTHY T.	BIOLOGICAL SCIENCE	WHITE
65201	COLUMBIA	GILBERT, DR. MARGUERITE	SOCIAL SCIENCE	WHITE
NEBRASKA				
68127	OMAHA	WELLS, MS. PAULA B.	MATHEMATICS	WHITE
NEVADA				
89507	RENO	WAKEFIELD, DR. CAROLINE	BIOLOGICAL SCIENCE	WHITE
NEW JERSEY				
07043	UPPER MONTCLAIR	SEEGMILLER, DR. BONNI	SOCIAL SCIENCE	WHITE
07071	LYNDHURST	TELFKY, MS. LORRAINE S.	PHYSICAL SCIENCE	WHITE
07102	NEWARK	WEIS, DR. JUDITH S.	BIOLOGICAL SCIENCE	WHITE
07801	DOVER	WEINTRAUB, MS. GERTRUDE	ENGINEERING	WHITE
08240	POMONA	ELMORE, DR. ELIZABETH	SOCIAL SCIENCE	WHITE
08240	POMONA	GITCHELL, MS. ALICE M.	PHYSICAL SCIENCE	WHITE
08240	POMONA	HERLANDS, DR. ROSALIND L.	BIOLOGICAL SCIENCE	WHITE
08240	POMONA	LEVIN, DR. SUZANNE	BIOLOGICAL SCIENCE	WHITE
NEW MEXICO				
87108	ALBUQUERQUE	SHISSLAK, DR. CATHERINE M.	SOCIAL SCIENCE	WHITE
87545	LOS ALAMOS	BARNES, MS. MARTHA	MATHEMATICS	
88130	PORTALES	AGUCINO, DR. MERCEDES M.	PHYSICAL SCIENCE	WHITE
NEW YORK				
10016	NEW YORK	ROSSMAN, DR. TORY G.	BIOLOGICAL SCIENCE	WHITE
10023	NEW YORK	ROBERTS, DR. JOAN L.	PHYSICAL SCIENCE	WHITE

APPENDIX H

1978 Pilot Program Experimental and Control Follow-up Questionnaires

ID# _____

O.M.B. No. 99-R0310
Approval Expires 5/31/82

1977-78 VISITING WOMEN SCIENTISTS PROGRAM
FOLLOW-UP QUESTIONNAIRE

Name _____ Title _____

School _____ State _____

Last year your school participated in the Visiting Women Scientists Program; as part of this program the school received a Resource Packet on women in science careers. We would like to enlist your aid in evaluating the impact of this program; you will probably need to consult with several of your colleagues in order to answer these questions.

1. Were you the contact person for the Visiting Women Scientists Program last year?

(Circle one.)

Yes 1
No 2

2. The number of female students seeking information about science careers from guidance counselors since the program has been:

(Circle one.)

More than the usual number for a similar period of time 1
About the usual number number for a similar period of time . 2
Less than the usual number for a similar period of time 3

3a. Does your school have a copy of the Occupational Outlook Handbook?

(Circle one.)

Yes ..... 1 *Go to Q3b.*
No ..... 2 *Go to Q4a.*
Don't Know ..... 3 *Go to Q4a.*

3b. The number of female students using the Occupational Outlook Handbook since the program has been:

(Circle one.)

More than the usual number 1
About the usual number 2
Less than the usual number 3

4a. The number of female students enrolling in elective mathematics courses since the program has been:

(Circle one.)

More than the usual number 1
About the usual number 2
Less than the usual number 3

(OVER)

4b. The number of female students enrolling in elective science courses since the program has been:

(Circle one.)

More than the usual number 1
About the usual number 2
Less than the usual number 3

5a. Has the Resource Packet been used?

(Circle one.)

Yes ..... 1 *Go to Q5b.*
No ..... 2 *Go to Q6.*
Don't Know .... 3 *Go to Q6.*

5b. If yes, by whom?

(Circle all that apply.)

a) Students 1
b) Teachers 2
c) Counselors 3
d) Librarians 4
e) Administrators 5
f) Others 6

6. Have any films or other materials listed in the Guide to Counselor's Resource Packet been ordered?

(Circle one.)

Yes 1
No 2
Don't Know 3

7. If the Visiting Women Scientists Program becomes available in your area again, would your school like to participate?

(Circle one.)

Yes 1
No 2

Please use this space for any comments you wish to add and return this questionnaire to RTI in the enclosed postage-paid envelope.

THANK YOU FOR YOUR COOPERATION.

ID# _____

O.M.B. No. 99-R0310
Approval Expires 5/31/82

1977-78 WOMEN IN SCIENCE CAREERS PROGRAM
FOLLOW-UP QUESTIONNAIRE

Name _____ Title _____

School _____ State _____

Last year your school received a Resource Packet on women in science careers as part of the National Science Foundation's Visiting Women Scientists Program. We would like to enlist your aid in evaluating the impact of this program; you will probably need to consult with several of your colleagues in order to answer these questions.

1. Were you the contact person for the Visiting Women Scientists Program last year?

(Circle one.)

Yes 1
No 2

2. The number of female students seeking information about science careers from guidance counselors since the Resource Packet was received has been:

(Circle one.)

More than the usual number for a similar period of time 1
About the usual number for a similar period of time 2
Less than the usual number for a similar period of time 3

3a. Does your school have a copy of the Occupational Outlook Handbook?

(Circle one.)

Yes ..... 1 *Go to Q3b.*
No ..... 2 *Go to Q4a.*
Don't Know ..... 3 *Go to Q4a.*

3b. The number of female students using the Occupational Outlook Handbook since the program has been:

(Circle one.)

More than the usual number 1
About the usual number 2
Less than the usual number 3

4a. The number of female students enrolling in elective mathematics courses since the Resource Packet was received has been:

(Circle one.)

More than the usual number 1
About the usual number 2
Less than the usual number 3

(OVER)

4b. The number of female students enrolling in elective science courses since the Resource Packet was received has been:

(Circle one.)

More than the usual number	1
About the usual number	2
Less than the usual number	3

5a. Has the Resource Packet been used?

(Circle one.)

Yes	1	*Go to Q5b.*
No	2	*Go to Q6.*
Don't Know	3	*Go to Q6.*

5b. If yes, by whom?

(Circle all that apply.)

a)	Students	1
b)	Teachers	2
c)	Counselors	3
d)	Librarians	4
e)	Administrators	5
f)	Others	6

6. Have any films or other materials listed in the Guide to Counselors Resource Packet been ordered?

(Circle one.)

Yes	1
No	2
Don't Know	3

Please use this space for any comments you wish to add and return this questionnaire to RTI in the enclosed postage-paid envelope.

THANK YOU FOR YOUR COOPERATION.